United States Court of Appeals

for the Second Circuit

EXHIBITS

74-1496

In The

United States Court of Appeals

For The Second Circuit

KOPPERS COMPANY, INC., and UNIVERSAL CORRUGATED BOX MACHINERY CORPORATION,

Plaintiffs-Appellees,

vs.

S & S CORRUGATED PAPER MACHINERY CO., INC.,

Defendant-Appellant.

APPELLANT'S APPENDIX

EXHIBIT VOLUME

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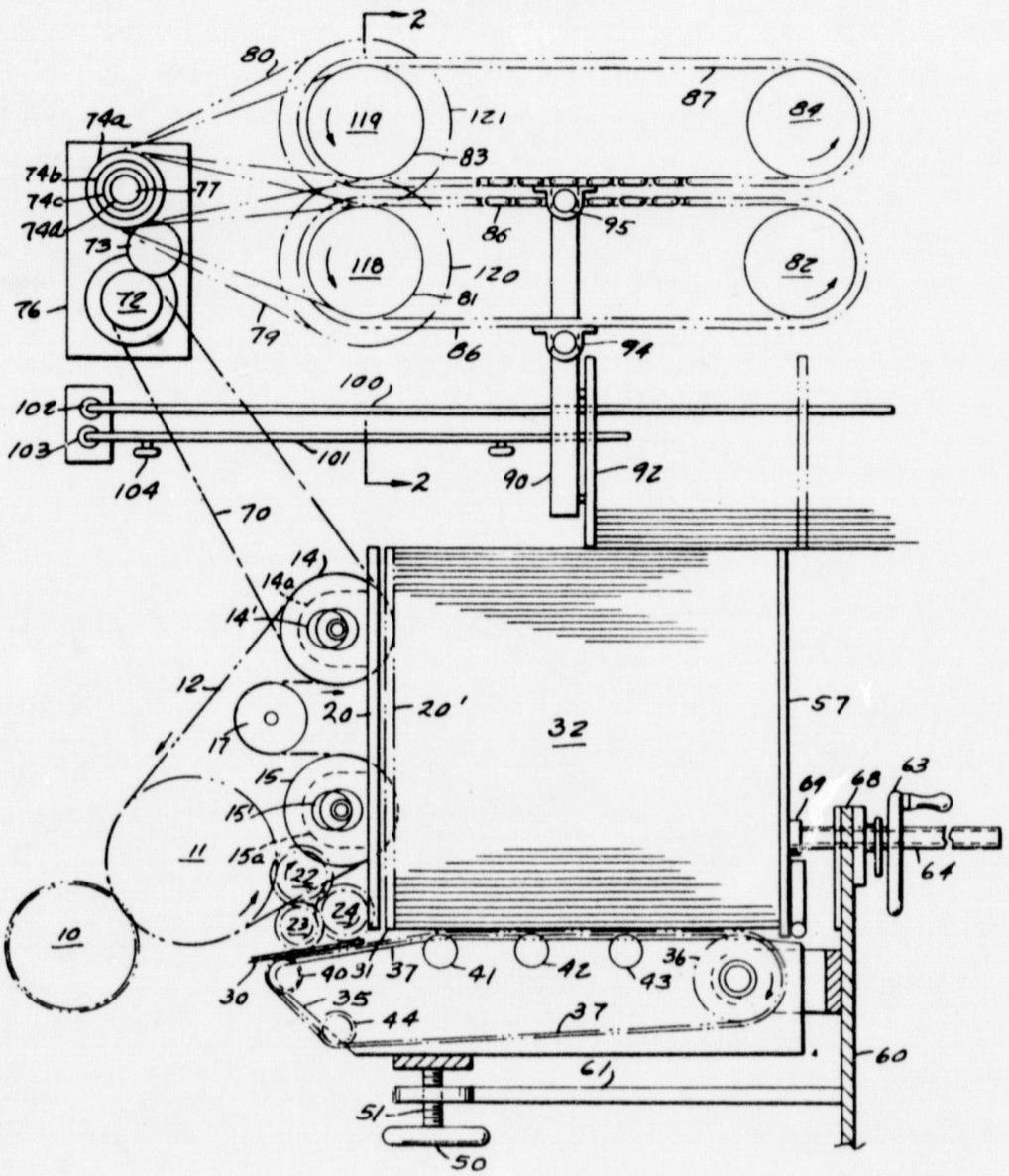
PLAINTIFFS' EXHIBIT 1 - PAT. NO. 2,988,236 E1

June 13, 1961 A. F. SHIELDS 2,988,236

BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

Filed Dec. 4, 1956 2 Sheets-Sheet 1

FIG. 1.



INVENTOR.
ALBERT F. SHIELDS

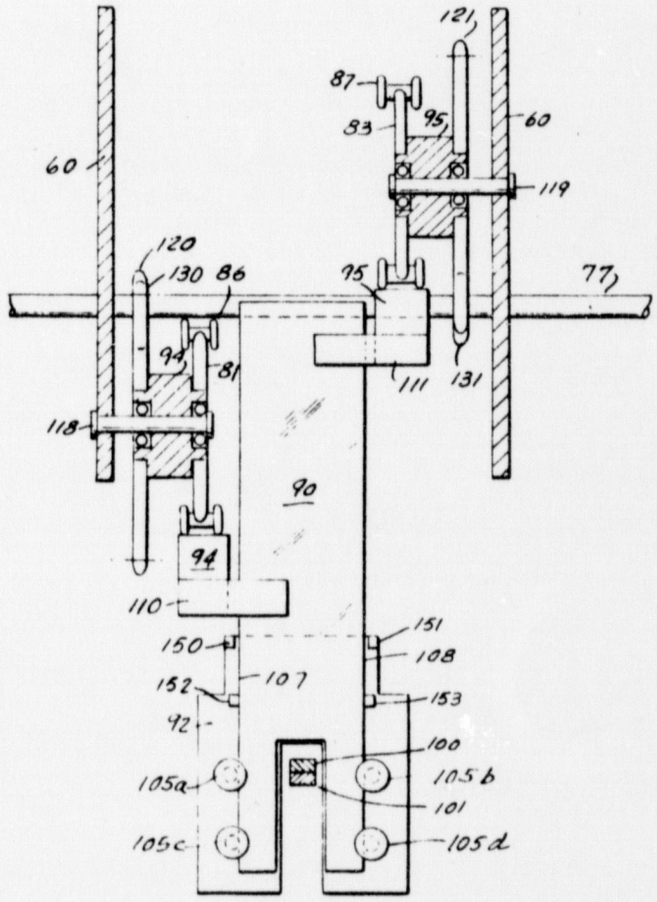
BY Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

June 13, 1961 A. F. SHIELDS 2,988,236

BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

Filed Dec. 4, 1956 2 Sheets-Sheet 2

FIG. 2.



INVENTOR.
ALBERT F SHIELDS
BY Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

United States Patent Office 2,988,236 Patented June 13, 1961

2,988,236

BLANK STACKING, STRAIGHTENING, AND DELIVERY DEVICE

Albert F. Shields, Forest Hills, N.Y., assignor to S & S Corrugated Paper Machinery Company, Inc., Brooklyn, N.Y., a corporation of New York

Filed Dec. 4, 1956, Ser. No. 626,100
5 Claims. (Cl. 214—6)

This invention relates to a blank stacking, straightening and delivery device and, more particularly, to a device for piling, straightening and accurately delivering box blanks issuing from a machine adapted to operate on the blanks such as a folding machine or slotting creasing machine.

The device of the present invention finds particular application in instances where box blanks are operated on rapidly and must be subsequently delivered rapidly to the next processing operating without the necessity uneconomical hand operations.

In acordance with the present invention this result is obtained by combining, in a single automatic device, which is readily synchronized with the movement of the machine for operating on the box blanks, a combined stacking, straightening and delivering device in which a plurality of blanks are stacked from below and, periodically, a pile of blanks is removed from the top of the stack. By the time the stack is delivered from this device they have been properly aligned mechanically through the use of a novel straightening mechanism hereinafter set forth in more detail.

Accordingly it is an object of the present invention to provide a combined blank stacking, straightening and delivery device which is rapid, accurate and minimizes the necessity for hand operations.

Another object of the present invention is to provide a stacking, straightening and delivery device which is readily synchronized with a machine which operates on such blanks and allows the ultimate issuance from the said machine of a stack having a predetermined number of properly aligned box blanks.

These and other objects of the present invention will become more apparent when taken in connection with the following description and the drawings in which:

FIGURE 1 is a side elevation of the mechanism of the present invention showing how the blanks are received, stacked, straightened and delivered.

FIGURE 2 is a cross-section of the device which delivers a stack of blanks from the machine of the present invention and is taken along the lines 2—2 of FIGURE 1 looking in the direction of the arrows.

Essentially the present invention involves a mechanism particularly adapted for use in connection with machines which operate on box blanks such as slotting and creasing machines, folding machines or other similar machines well known to the art. This invention has particular utility in stacking and straightening inaccurately folded blanks and by employing the underfeeding technique hereindisclosed there is always sufficient pressure maintained within the stack to allow for complete gluing of the folded blanks. The delivery mechanism herein disclosed will obviously be useful on both folded and unfolded blanks.

The mechanism herein contemplated includes a conveyor operable in synchronization with the machine which has previously worked upon the box blanks, and a stacking and straightening device above the said conveyor comprising means transverse to the direction of motion of the blanks and between which is accumulated a stack of the said blanks. The stack accumulating portion of the present invention would include two plates, one having an opening thereunder sufficient to permit the entry of at least one blank at a time and another plate which is adapted to about the front end of the stack of blanks. Means are provided for oscillatorily operating the former plate in a longitudinal direction and which motion imparts to this plate a slapper action and thereby provides a means for aligning the stack of blanks.

The two plates between which the stack is confined are open at the upper end and a longitudinally movable plate for periodically pushing a stack of said blanks from the upper end of the accumulating device is provided so that the lowermost edge of the pusher plate will clear the uppermost edge of the transverse plate abutting the front end of the stack of blanks. The blank pushing mechanism is also operated in synchronism with the conveying means, but the blanks are fed into the present device and are further supported so that when in contact with the blanks it remains in substantially vertical position. Flexible longitudinally extending hold-down bars are also provided so as to prevent dislocation of the top of the stack until delivery of the blanks therefrom.

Referring now to the drawings in more detail, power is supplied to the machine through gear 10 which is also coordinated with the movement of the folding, slotting and creasing, or other machine from which the blanks issue. This, in turn, drives sprocketed wheel 11 which carries a chain 12 therewith. The chain moving in the direction of the arrows drives the wheels 14 and 15 interconnected by idler 17. Brackets 14*a*, 15*a* extending rearward from slapper plate 20 are mounted to eccentrics 14', 15', respectively, which are mounted to wheels 14, 15, respectively. These eccentrics cause a periodic reciprocating or longitudinal oscillatory movement of slapper plate 20 so that it ultimately moves from the position shown by the solid lines 20 to that illustrated by the dotted lines 20'. This specific mechanism for causing oscillatory movement of slapper plate 20 is only, of course, exemplary of a preferred embodiment of this invention, and other mechanisms for causing this result would be apparent to those skilled in the art.

Through an appropriate gear mechanism illustrated by members 22, 23 and 24 means are provided for conveying the box blank 30 forward underneath the space 31 below the slapper plate and thereby causes the stack 32 to be added to from underneath. The conveyor 35, driven from wheel 36, the movement of which is also coordinated with that of driver 10, is sloped at section 37 thereof so as to allow the entry of blanks from underneath the stack 32. The conveyor further rides on idler rolls 40, 41, 42 and 43 and 44.

A height adjustment which is operated manually by wheel 50 is secured to the frame of the machine 60 and by adjustment of the threaded member 51 the space of entry of the blank into the stack may be accurately varied in accordance with the blank thickness. The threaded member 51 is supported by rigid frame extension 61.

In order to adjust the machine for the proper length of blanks, hand wheel 63 is provided which controls the longitudinal position of plate 57 which in turn abuts the leading edge of each of the blanks in the stack. The adjustment of this plate is made by a movement of threaded member 64 which passes through the frame at 68 and is secured to plate 57 at 69.

It is also apparent that wheel 14 carries a sprocket which in turn causes the chain 70 to be moved in coordination with the driver 10. The chain in turn causes movement of driver 72 which through a series of internal gears, illustrated as 73, is made to engage one of a plurality of gears 74*a*, *b*, *c* or *d*. This mechanism is encased in a gear box 76 and is illustrative of one well-known common gearing mechanism well known to the art for transmitting any one of a number of pre-selected gearing ratios.

The gear member 74 is secured to a shaft 77 which carries sprocket wheels 130, 131 engaged by chains 79 and 80, respectively, which in turn drive sprocket wheels 120 and 121, respectively. These two sprocket wheels are mounted on common shafts 118 and 119, respectively, which in turn drives sprockets 81 and 83. The chains 86 and 87 driven by these respective sprocket wheels are also carried by sprockets 82 and 84. These two chains provide means by which the plate support 90 and pusher plate 92 may be maintained in a substantially vertical position throughout the operation of the device and particularly through the entire time when the plate 92 contacts the rear edge of the blanks. This is accomplished by the support 90 secured to the chain 86 by a bushing 94, while at the same time the other transverse side of the plate support is secured to chain 87 by bushing 95.

The blanks in addition to being aligned by slapper plate 20 are maintained in alignment by means of a pair of flexible hold-down strips 100 and 101 which are rigidly secured to the frame of the machine at 102 and 103, respectively. The strip 101 is adjustable by means of a telescoping section (not shown) which is held in place by knobs 104 and by any other suitable means. Hold-down strips 100 and 101 maintain a downward pressure on stack 32 thereby maintaining the folds in the blanks of stack 32 during both the delivery and accumulating periods. During the delivery period when the stack being removed clears the free end of the shorter strip 101, the strip 101 is now in position to engage the top of the remaining stack as it advances upward. During this period the longer strip 100 remains in engagement with the top of the stack being removed.

The pusher plate, which operates in predetermined synchronization with the stacking and straightening device in order to periodically deliver a stack containing a given number of blanks, is vertically slidable by means of wheels 105*a*, *b*, *c* and *d*, mounted to pusher plate 92, which are adapted to ride on vertical rails 107 and 108, respectively, mounted to support plate 90. Thus, as pusher plate 92 delivers a pile of blanks from the machine, the stack is continuously rising and because of wheels 105*a*, *b*, *c* and *d* riding on rails 107 and 108 the pusher plate is made to rise in response to the movement of the top of the portion of the stack not being delivered. Thus the pusher plate does not interfere with the increasing stack even during the delivery period. A suitably positioned stop (not shown) is included to limit the downward movement of plate 92. In order that one side of the plate support 90 is secured to bushing 94 at 110, while the other side is secured at 111 to the bushing 95, the bushings have their respective shafts 118 and 119 which pass therethrough rigidly secured to the frame of the machine 60. Lugs 150, 151 projecting from pusher plate 92 are positioned to engage ears 152, 153 respectively, of support member 90 to thereby limit the downward movement of pusher plate 92.

In the foregoing, I have described my invention only in connection with preferred embodiments thereof. Many variations and modifications of the principles of my invention within the scope of the description herein are obvious. Accordingly, I prefer to be bound not by the specific disclosure herein, but only by the appending claims.

I claim:

1. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks, comprising, a conveyor operable in synchronism with the said machine to move said blanks in a first, or longitudinal, direction, a device above the conveyor to intercept and accumulate blanks issuing from the machine thereby forming a blank stack being fed from below, said device including a pair of plates transverse to the direction of motion of the blanks between which the blanks between which the blanks may be accumulated; one of the said plates abutting the trailing edge of the blanks in the stack and being periodically reciprocally movable in a longitudinal direction to apply a straightening force to the blanks; an opening under said plate sufficient to permit the entry of at least one blank at a time, and above the upper end of said plates, a longitudinally movable plate for periodically pushing a top portion of the stack of said blanks from the said accumulating device and means for supporting the said pusher plate so that it remains in a substantially vertical position when in contact with the said blank stack, said pusher plate being mounted for limited vertical movement relative to the means for supporting the pusher plate, said stack being fed with blanks as the movable plate is removing said top portion from the stack.

2. The device as set forth in claim 1 including means for holding down the top of the remaining portion of the stack of blanks until delivery of the top portion of the said stack is completed and also exerting a hold-down force to the blanks remaining in the accumulating device during delivery of said stack.

3. A stacking, straightening and delivery mechanism adapted for use with a machine for operating box blanks, comprising a conveyor operable in synchronism with the said machine to move said blanks in a first or longitudinal direction, a device above the conveyor to intercept and accumulate blanks issuing from the machine, said device including straightening means comprising a pair of plates positioned transverse to the direction of motion of the blanks between which the blanks may be accumulated in a stack; one of the said plates abutting the trailing edge of the blanks in the stack and being periodically oscillatorily movable in a longitudinal direction; an opening under said plate sufficient to permit the entry of at least one blank at a time, and above the upper end of said plates a longitudinally movable vertically extending pusher plate for periodically pushing a top portion of said stack of said blanks from the said accumulating device while the bottom portion of said stack remains in said device, said pusher plate being operated in synchronism with said machine, said plate having the bottom edge thereof resting upon the top of said bottom portion of said stack while said top portion is being removed by said plate, said conveyor being timed to continue delivery of blanks to the bottom of said stack while said pusher plate is removing the top portion of the stack; a support plate carrying said pusher plate; said pusher plate being vertically movable relative to said support plate.

4. A stacking, straightening and delivery mechanism for transporting box blanks comprising a conveyor for moving the blanks in a first, or longitudinal, direction into the mechanism, straightening means comprising a pair of plates transverse to the direction of motion of the conveyor for confining a stack of blanks, one of the said plates abutting the trailing edge of the blanks in the stack and being periodically reciprocally movable in a longitudinal direction for aligning the blanks; a continuously movable pusher plate periodically engageable with a top portion of said stack for removal thereof, and a common drive means for synchronizing the movement of the said conveyor, said reciprocally movable plate, and said pusher plate so that the elements operate in a predetermined sequence, a support plate for maintaining said pusher plate substantially vertical at all times, said pusher plate mounted to said support plate for vertical movement relative thereto.

5. A stacking, straightening and delivery mechanism adapted for use with a machine for operating box blanks, comprising a conveyor operable in synchronism with the said machine to move said blanks in a first or longitudinal direction, a device above the conveyor to intercept and accumulate blanks issuing from the machine; said device comprising a first and a second means for engaging the blanks at the leading and trailing edges, respectively, thereof to thereby form a stack of blanks being fed from below; an opening under said second means suf-

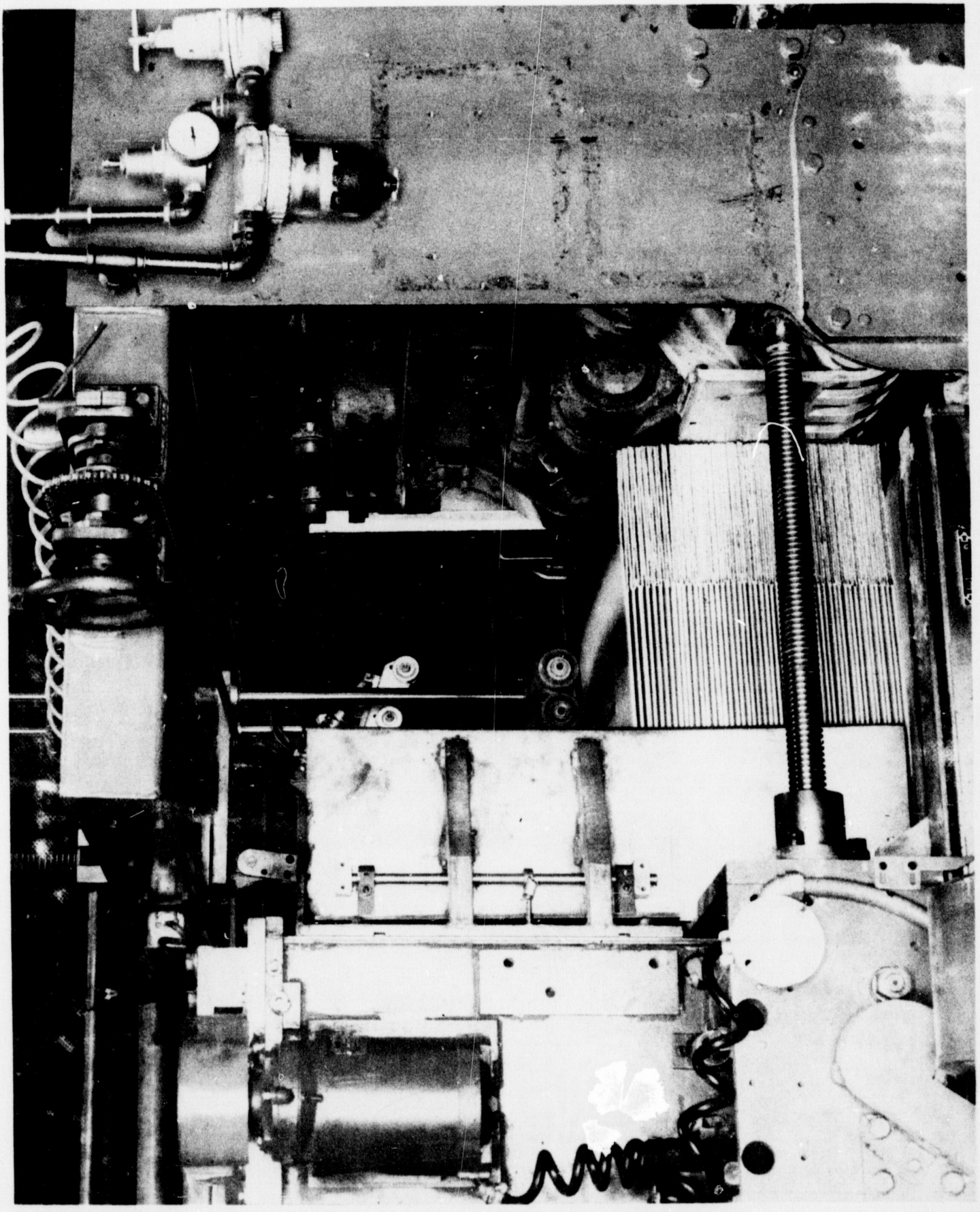
ficient to permit the entry of at least one blank at a time, said device constructed and operated to apply a straightening force to the blanks in the stack, and above the upper end of said device a longitudinally movable vertically extending pusher plate for periodically pushing a top portion of said stack of said blanks from the said accumulating device while the bottom portion of said stack remains in said device, said pusher plate being operated in synchronism with said machine, said plate having the bottom edge thereof resting upon the top of said bottom portion of said plate, said conveyor being timed to continue delivery of blanks to the bottom of said stack while said pusher plate is removing the top portion of the stack; a support plate carrying said pusher plate; said pusher plate being vertically movable relative to said support plate.

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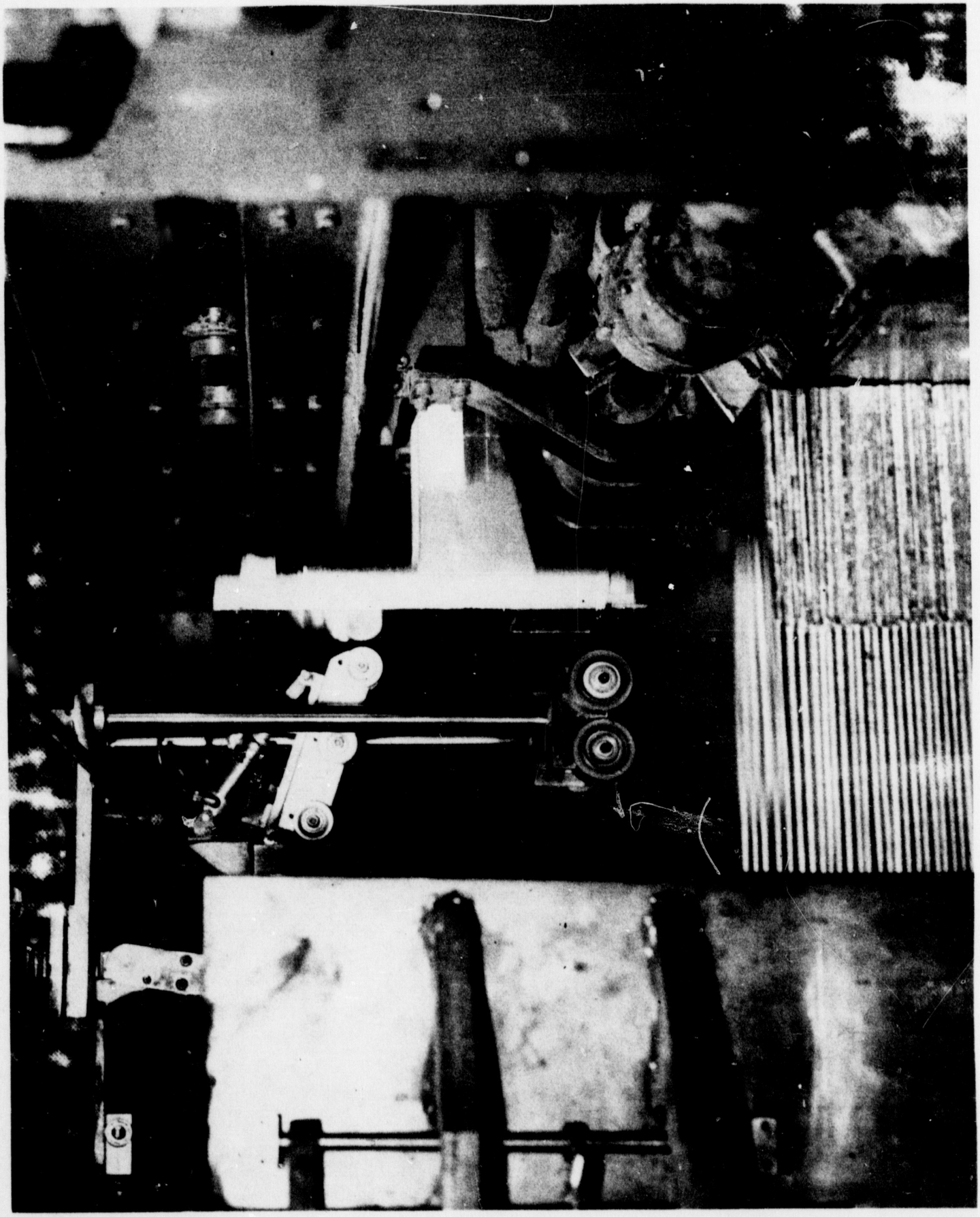
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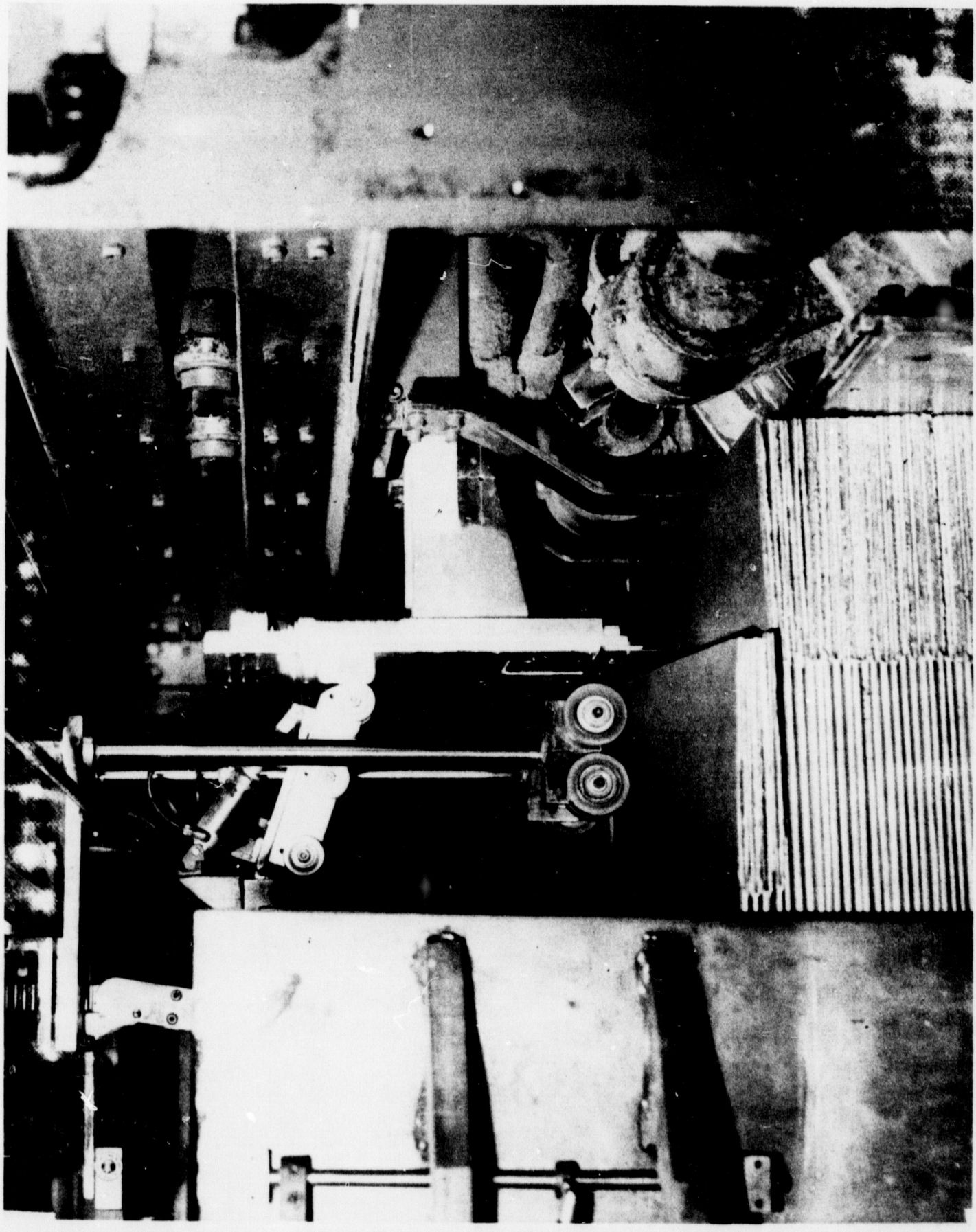
PLAINTIFFS' EXHIBIT 7 - PHOTOGRAPH E6



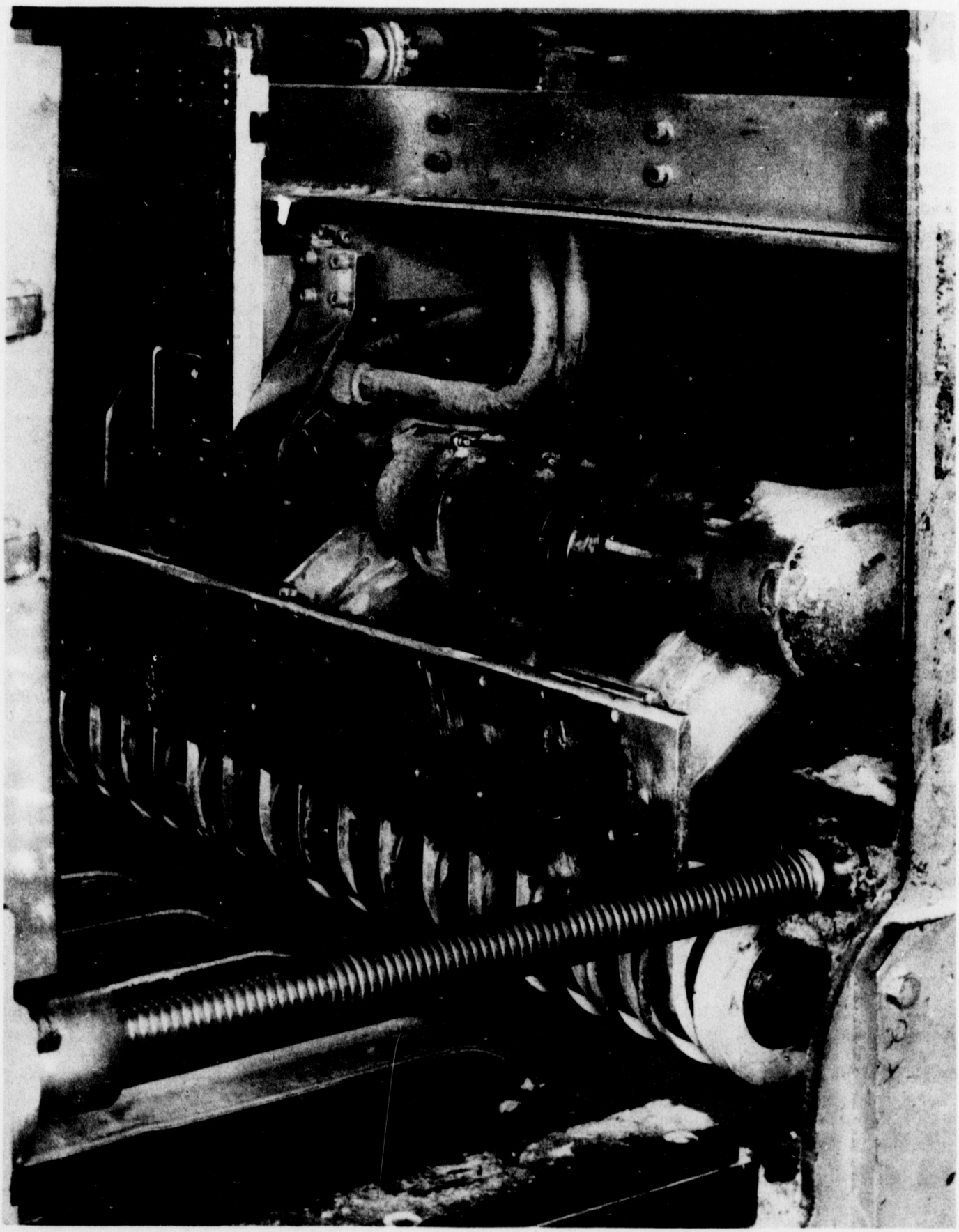
PLAINTIFFS' EXHIBIT 8 - PHOTOGRAPH



PLAINTIFFS' EXHIBIT 9 - PHOTOGRAPH

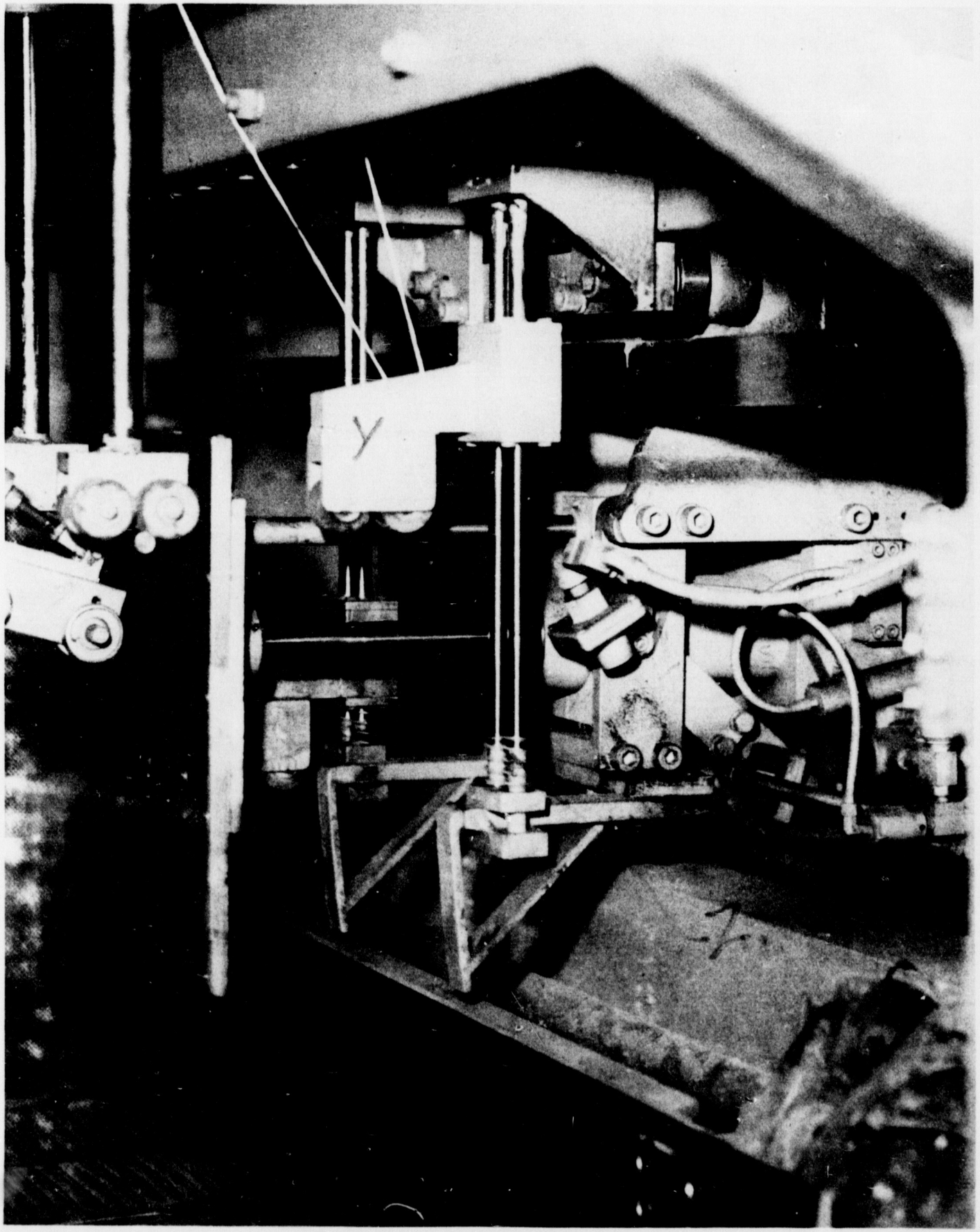


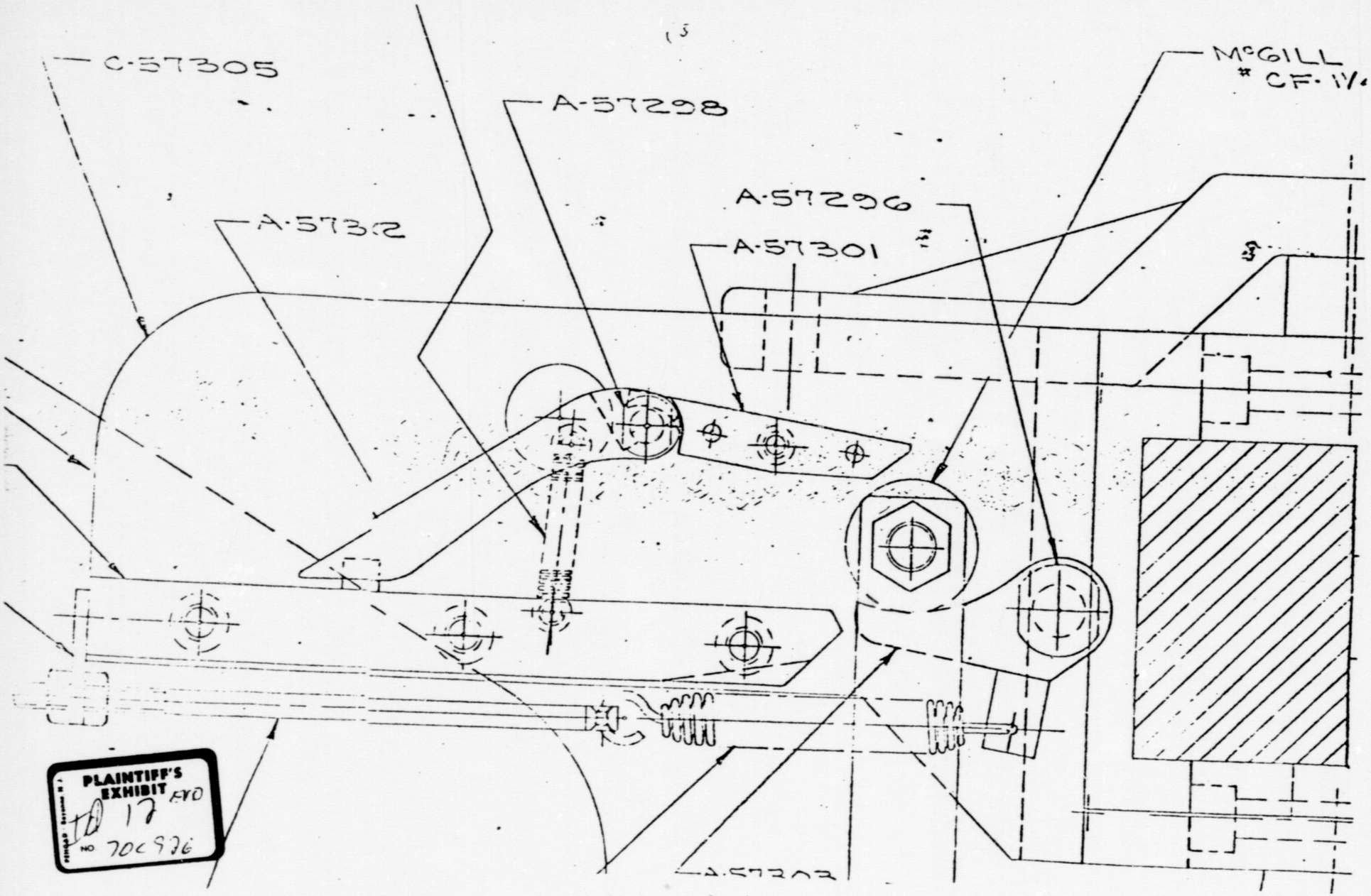
PLAINTIFFS' EXHIBIT 10 - PHOTOGRAPH



PLAINTIFFS' EXHIBIT 11 - PHOTOGRAPH

E 10





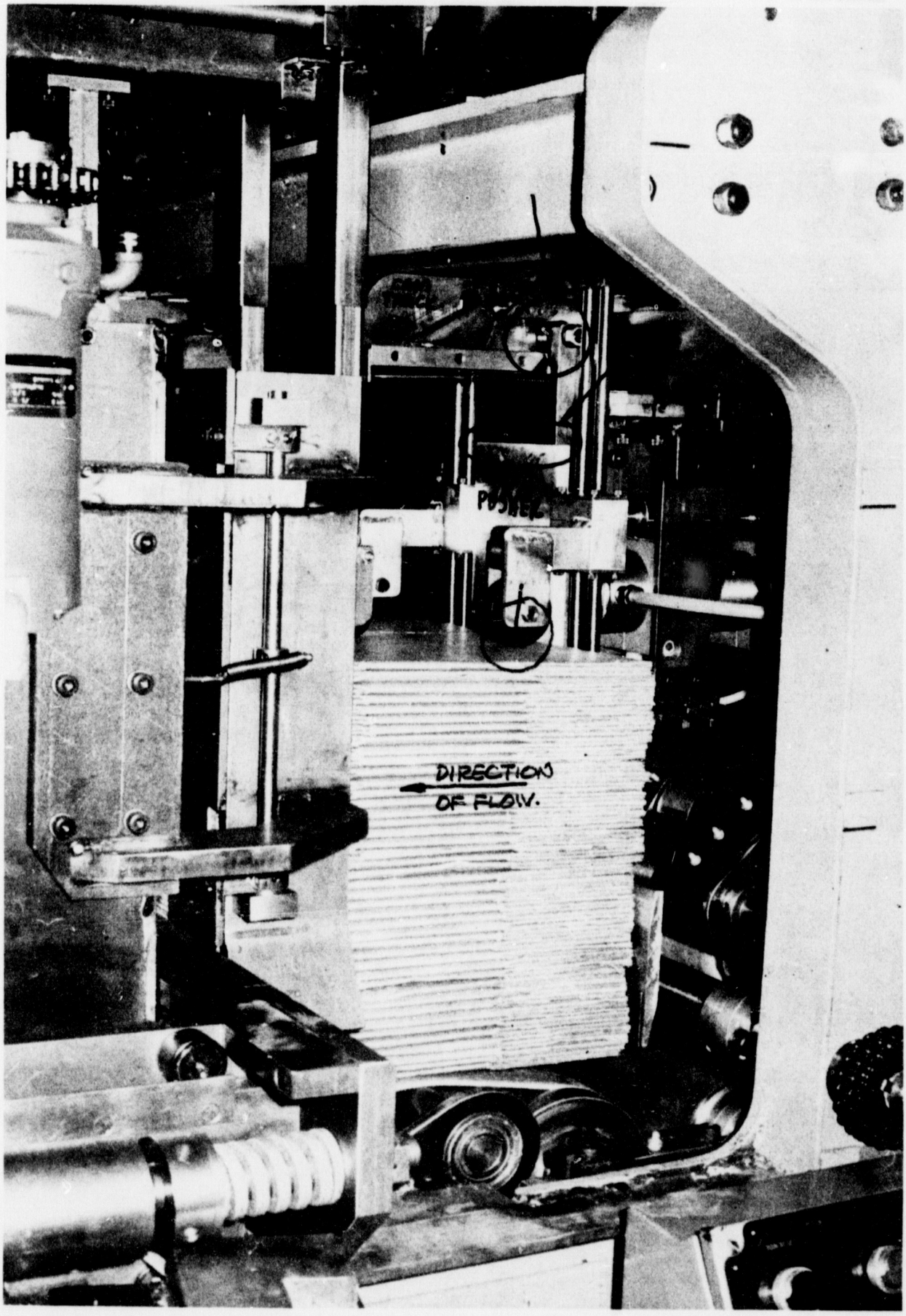
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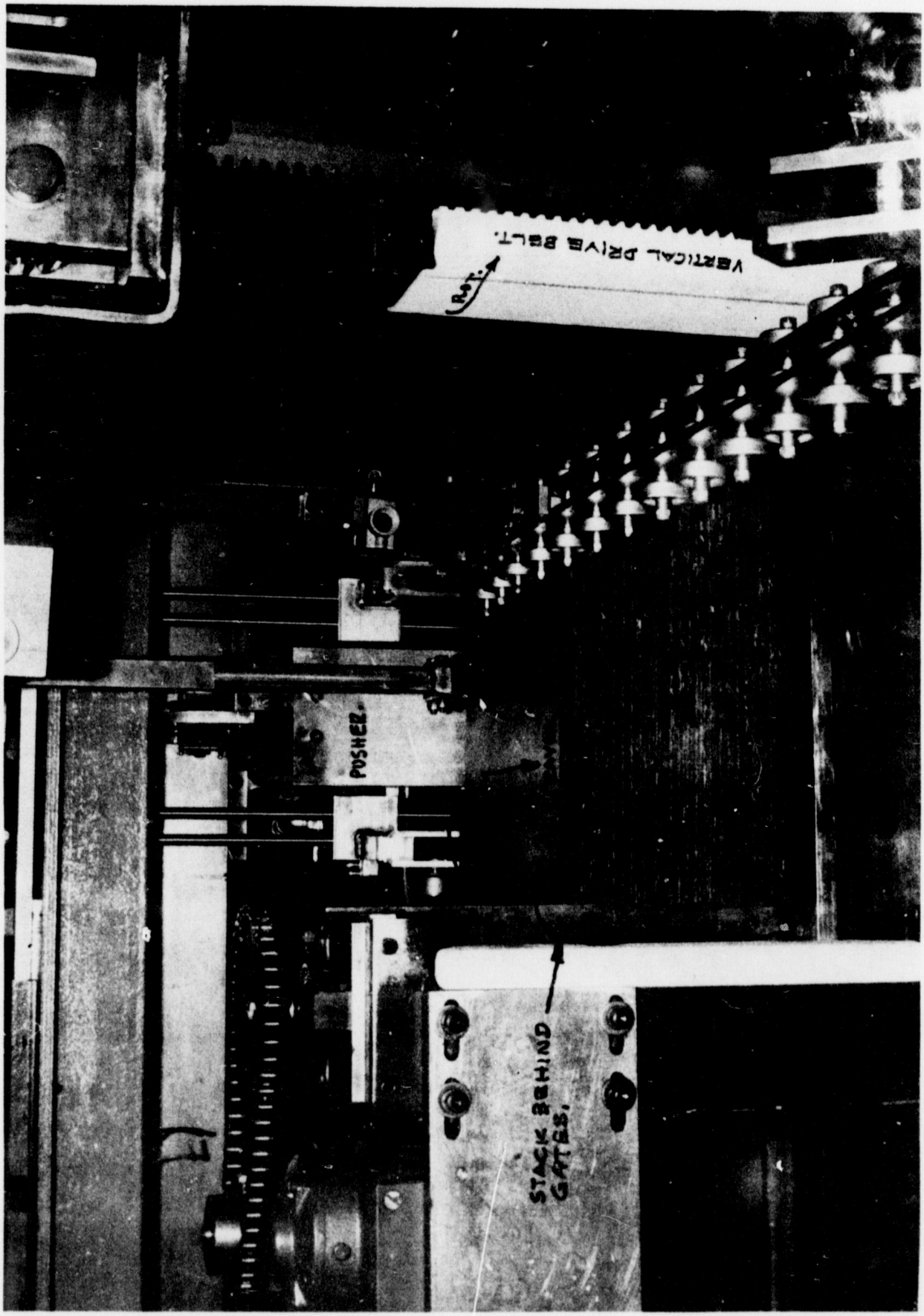
PLAINTIFFS' EXHIBIT 12 - DRAWING

E11

PLAINTIFFS' EXHIBIT 13 - PHOTOGRAPH E12

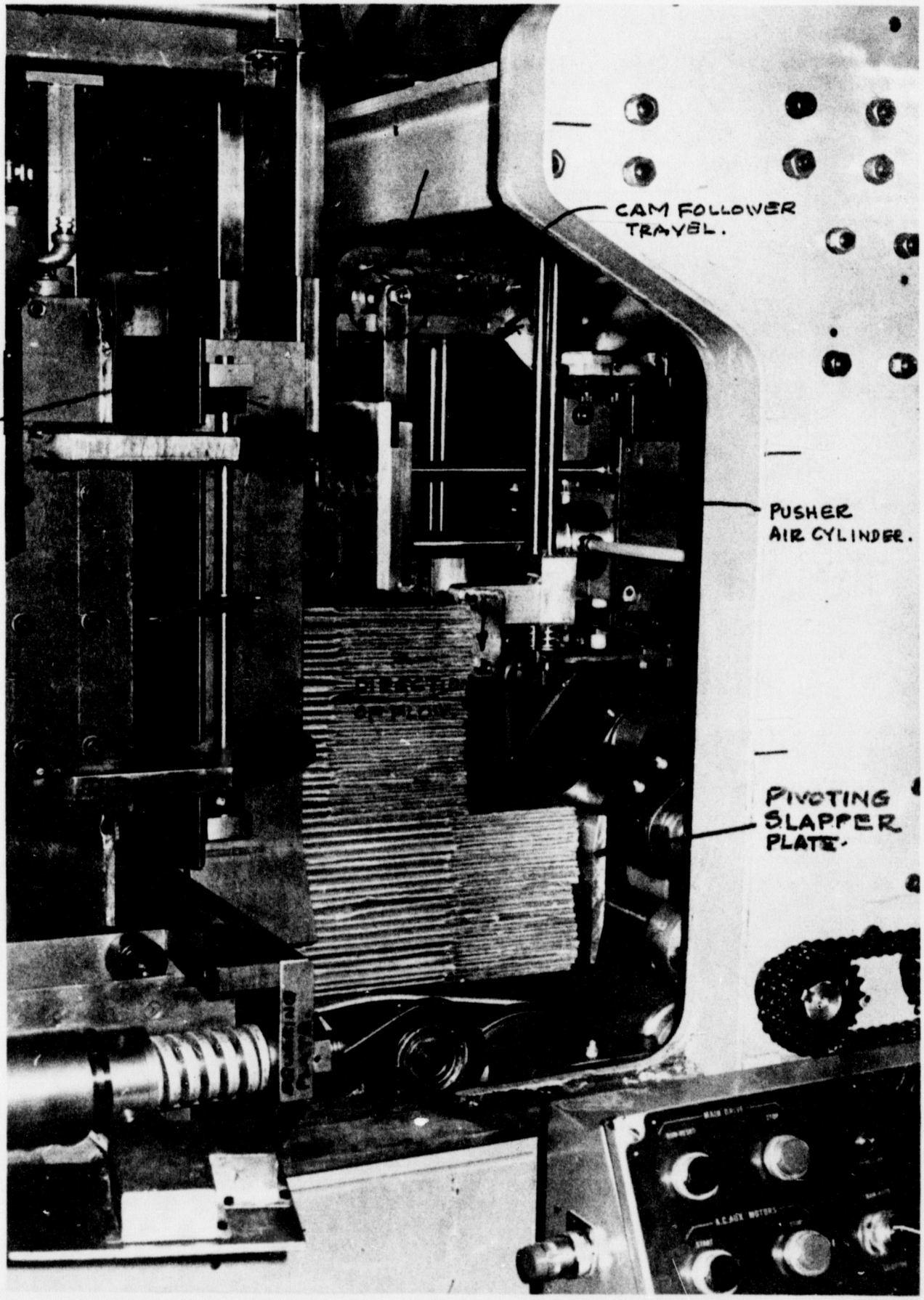
#1: STACK READY FOR EJECTION. (NOTE ITEMS DENOTED



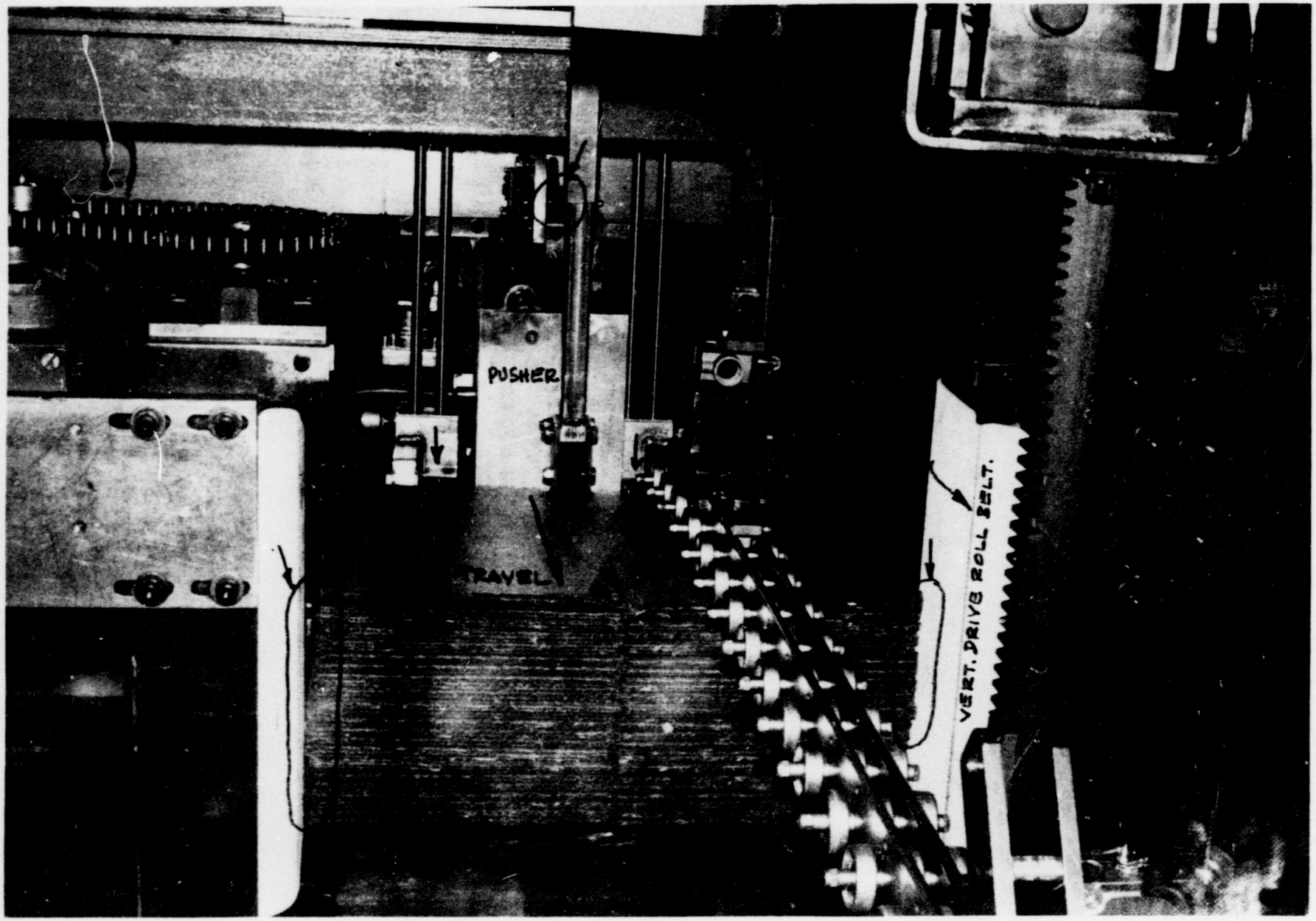


#3: STACK READY FOR EJECTION. (EXIT END VIEW)

#4: STACK STARTING TO BE EJECTED. (OPER. SIDE VIEW.)



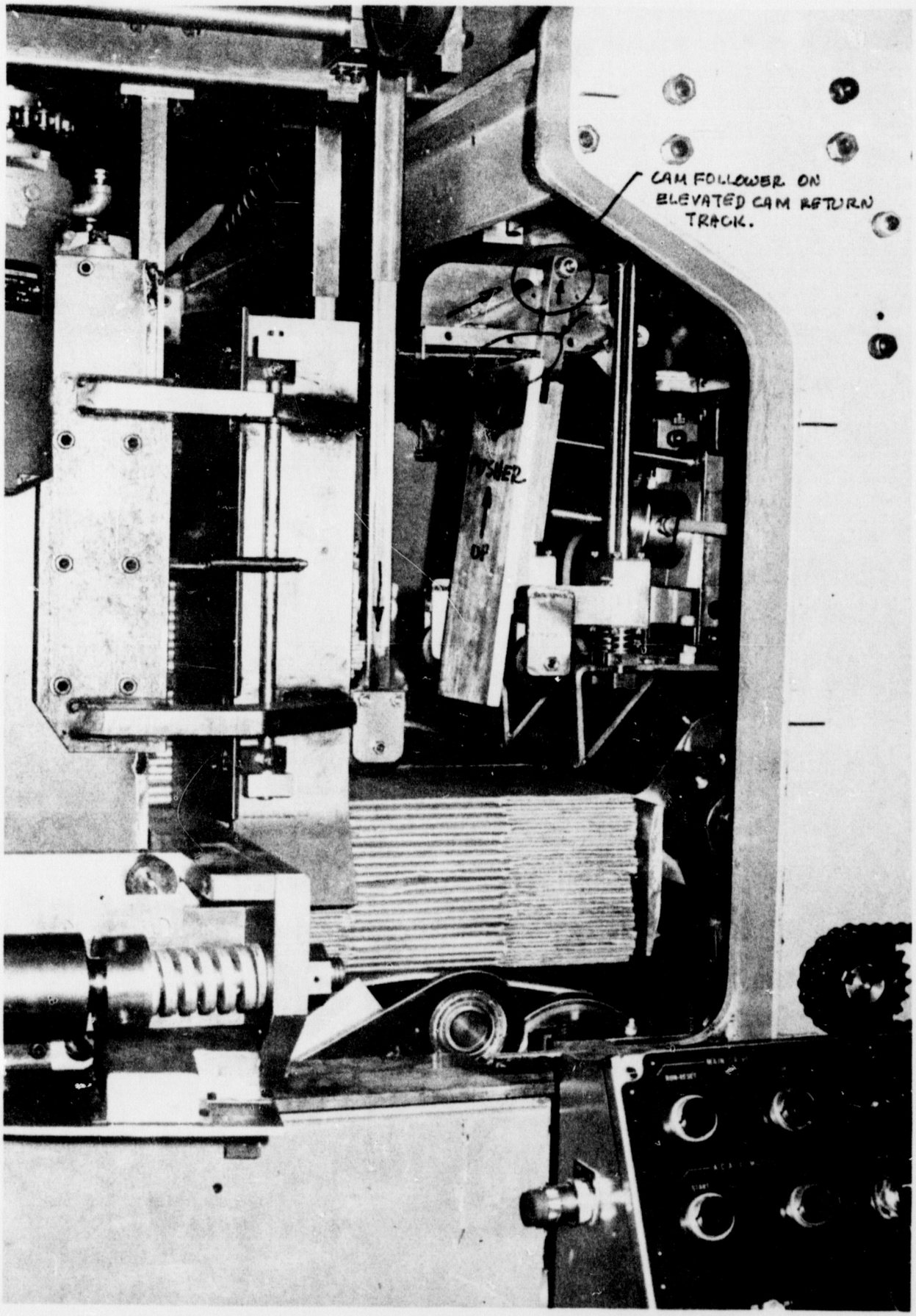
#5; STACK STARTING TO BE EJECTED. (EXIT END VIEW)
SHOWS EJECTED STACK BEING ENGAGED WITH VERTICAL DRIVE ROLL BELTS (BOTH SIDES)



PLAINTIFFS' EXHIBIT 16 - PHOTOGRAPH

E15

#8: STACK EJECTED; PUSHER ON RETURN STROKE (OPER. SIDE VIEW.)



#11: STACK BEING COMPLETELY EJECTED BY VERTICAL DRIVE ROLL BELTS. (EXIT END VIEW.)

626100 ✓
SERIAL NO. (Series of 1948)

P. R. Div. G

PATENT NUMBER 2988236

Assistant examiner Leq

Class 214 | Subclass 6

DATED JUN 13 1961

Division No. 35 4 Ha

Filed complete (Date) DEC 4, 1956

Serial No. 626 100

CLAIMS FOREIGN PRIORITY

Country	Date

Applicant(s)

(31)

SHIELDS, ALBERT F. OF FOREST HILLS, N. Y.

Number claims allowed	Print claim(s)	Class	Subclass
5	1	214	6

(2)

Assignor to J & J Corrugated Papers Machinery Company, Inc., Brooklyn, N.Y., a Corp of New York.

Title of invention

BLANK STACKING, STRAIGHTENING, AND DELIVERY DEVICE

☐ Division of ☐ Continuation of ☐ Continuation-in-part of

☐ Substitute for abandoned

APPLICATION Serial No.	Filed	APPLICATION Serial No.

Shtdrw.	Extra claims	Filing fee	Transaction	Atty's docket	Now Patent No.	Granted	Filed
2		$30	01025	S-110			

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Date DEC 13 1971

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626100
SERIAL NO. (Series of 1948)

P. R. Div.

PATENT NUMBER 2988236

DATED JUN 13 1961

Assistant examiner

Class 214 Subclass 6

Division No. 35 4

Filed complete (Date) DEC 4, 1956

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5	1	214	6

Assignor to F & J Corrugated Paper Machinery Company, Inc., Brooklyn, N.Y., a Corp. of New York.

Title of invention

BLANK STACKING, STRAIGHTENING, AND DELIVERY DEVICE

☐ Division of ☐ Continuation of ☐ Substitute for abandoned — APPLICATION

Serial No.	Filed

Now Patent No.	Granted

☐ Continuation in-part of — APPLICATION

Serial No.	Filed

Sh. dr.	Extra claims	Filing fee	Transaction	Atty's docket
2		$30	01025	S-110

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Associate attorney(s)

PARTS OF APPLICATION FILED SEPARATELY

PREPARED FOR ISSUE

Hagerter (Assistant Examiner) MDO (Docket Clerk)

EXAMINED AND PASSED FOR ISSUE

E.C. Fallo (Primary Examiner)

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OCT 26 1960

FINAL FEE

Date	Amount
APR 25 1961	$ Boos

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DEC -4 1956

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S-110 (formerly S-2217)
MCS:sw 6622
October 29/56

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BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

This invention relates to a blank stacking, straightening and delivery device and, more particularly, to a device for piling, straightening and accurately delivering box blanks issuing from a machine adapted to operate on the blanks such as a folding machine or slotting and creasing machine.

The device of the present invention finds particular application in instances where box blanks are operated on rapidly and must be subsequently delivered rapidly to the next processing operation without the necessity of uneconomical hand operations.

In accordance with the present invention this result is obtained by combining, in a single automatic deivce, which is readily synchronized with the movement of the machine for operating on the box blanks, a combined stacking, straightening and delivering device in which a plurality of blanks are stacked from below and, periodically, a pile of blanks is removed from the top of the stack. By the time the stack is delivered from this device they have been properly aligned mechanically through the use of a novel straightening mechanism hereinafter set forth in more detail.

Accordingly it is an object of the present invention to provide a combined blank stacking, straightening and delivery device which is rapid, accurate and minimizes the necessity for hand operations.

Another object of the present invention is to provide a stacking, straightening and delivery device which is readily synchronized with a machine which operates on such blanks and allows the ultimate issuance from the said machine of a stack having a predetermined number of properly aligned box blanks.

These and other objects of the present invention will become more apparent when taken in connection with the following description and the drawings in which:

Figure 1 is a side elevation of the mechanism of the present invention showing how the blanks are received, stacked, straightened and delivered.

Figure 2 is a cross-section of the device which delivers a stack of blanks from the machine of the present invention and is taken along the lines 2 - 2 of Figure 1 looking in the direction of the arrows.

Essentially the present invention involves a mechanism particularly adapted for use in connection with machines which operate on box blanks such as slotting and creasing machines, folding machines or other similar machines well known to the art. This invention has particular utility in stacking and straightening inaccurately folded blanks and by employing the underfeeding technique hereindisclosed there is always sufficient pressure maintained within the stack to allow for complete gluing of the folded blanks. The delivery mechanism herein disclosed will obviously be useful on both folded and unfolded blanks.

The mechanism herein contemplated includes a conveyer operable in synchronization with the machine which has previously worked upon the box blanks, and a stacking and straightening device above the said conveyor comprising means transverse to the direction of motion of the blanks and between which is accumulated a stack of the said blanks. The stack accumulating portion of the present invention would include two plates, one having an opening thereunder sufficient to permit the entry of at least one blank at a time and another plate which is adapted to abut the front end of the stack of blanks. Means are provided for oscillatorily operating the former plate in a longitudinal direction and which motion imparts to this plate a slapper action and thereby provides a means for aligning the stack of blanks.

The two plates between which the stack is confined are open at the upper end and a longitudinally movable plate for periodically pushing a stack of said blanks from the upper end of the accumulating device is provided so that the lowermost edge of the pusher plate will clear the uppermost edge of the transverse plate abuting the front end of the stack of blanks. The blank pushing mechanism is also operated in synchronism with the conveying means, but the blanks are fed into the present device and is further supported so that when in contact with the blanks it remains in substantially vertical position. Flexible longitudinally extending hold-down bars are also provided so as to prevent dislocation of the top of the stack until delivery of the blanks therefrom.

Referring now to the drawings in more detail, power is supplied to the machine through gear 10 which is also coordinated with the movement of the folding, slotting and creasing, or other machine from which the blanks issue. This, in turn, drives sprocketed wheel 11 which carries a chain 12 therewith. The chain moving in the direction of the arrows drives the ~~eccentrically mounted~~ wheels 14 and 15 interconnected by idler 17. These eccentrics cause a periodic longitudinal reciprocating or oscillatory movement of slapper plate 20 so that it ultimately moves from the position shown by the solid lines 20 to that illustrated by the dotted lines 20'. This specific mechanism for causing oscillatory movement of slapper plate 20 is only, of course, exemplary of a preferred embodiment of this invention, and other mechanisms for causing this result would be apparent to those skilled in the art.

Through an appropriate gear mechanism illustrated by members 22, 23 and 24 means are provided for conveying the box blank 30 forward underneath the space 31 below the slapper plate and thereby causes the stack 32 to be added to from underneath. The conveyor 35, driven from wheel 36, the movement of which is also coordinated with that of driver 10, is sloped at section 37 thereof so as to allow the entry of blanks from underneath the stack 32. The conveyor further rides on idler rolls 40, 41, 42 and 43 and 44.

A height adjustment which is operated manually by wheel 50 is secured to the frame of the machine ~~at~~ 60 and by adjustment of the threaded member 51 the space of entry of the

blank into the stack may be accurately varied in accordance with the blank thickness. The threaded member 51 is supported by rigid frame extension 61.

In order to adjust the machine for the proper length of blanks, hand wheel 63 is provided which controls the longitudinal position of plate 57 which in turn abuts the leading edge of each of the blanks in the stack. The adjustment of this plate is made by a movement of threaded member 64 which passes through the frame at 68 and is secured to plate 57 at 69.

It is also apparent that ~~eccentric~~ wheel 14 carries a sprocket which in turn causes the chain 70 to be moved in coordination with the driver 10. The chain in turn causes movement of driver 72 which through a series of internal gears, illustrated as 73, is made to engage one of a plurality of gears 74a, b, c or d. This mechanism is encased in a gear box 76 and is illustrative of one well-known common gearing mechanism well known to the art for transmitting any one of a number of pre-selected gearing ratios.

The gear member 74 is secured to a shaft ~~wheel~~ 77 which carries chains 79 and 80, respectively, which in turn drive sprocket wheels 120 and 121, respectively. These two sprocket wheels are mounted on common shafts 118 and 119, respectively, which in turn drives sprockets 81 and 83. The chains 86 and 87 driven by these respective sprocket wheels are also carried by sprockets 82 and 84. These two chains

provide means by which the plate support 90 and pusher plate 92 may be maintained in a substantially vertical position throughout the operation of the device and particularly through the entire time when the plate 92 contacts the rear edge of the blanks. This is accomplished by the support 90 secured to the chain 86 by a bushing 94, while at the same time the other transverse side of the plate support is secured to chain 87 by bushing 95.

The blanks in addition to being aligned by slapper plate 20 are maintained in alignment by means of a pair of flexible hold-down strips 100 and 101 which are rigidly secured to the frame of the machine at 102 and 103, respectively. These strips are adjustable by means of knobs 104 and by any other suitable means.

The pusher plate, which operates in predetermined synchronization with the stacking and straightening device in order to periodically deliver a stack containing a given number of blanks, is vertically slidable by means of wheels 105a, b, c and d which are adapted to ride on vertical rails 107 and 108, respectively. Thus, as pusher plate 92 delivers a pile of blanks from the machine, the stack is continuously rising and by means of wheels 105a, b, c and d riding on rails 107 and 108 the pusher plate is made to rise in response to the movement of the top of the stack. In order that one side of the plate support 90 is secured to bushing 94 at 110,

while the other side is secured at 111 to the bushing 95, the bushings have their respective shafts 118 and 119 which pass therethrough rigidly secured to the frame of the machine 60.

In the foregoing, I have described my invention only in connection with preferred embodiments thereof. Many variations and modifications of the principles of my invention within the scope of the description herein are obvious. Accordingly, I prefer to be bound not by the specific disclosure herein, but only by the appending claims.

I CLAIM:

1. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks, comprising, a conveyor operable in synchronism with the said machine, a device above the conveyor to intercept and accumulate blanks issuing from the machine, said device including a pair of plates transverse to the direction of motion of the blanks between which the blanks may be accumulated; one of the said plates abuting the trailing edge of the blanks in the stack and being periodically ~~oscillatorily~~ reciprocally movable in a longitudinal direction, an opening under said plate sufficient to permit the entry of at least one blank at a time, and above the upper end of said plates, a longitudinally movable plate for periodically pushing a stack of said blanks from the said accumulating device and means for supporting the said pusher plate so that it remains in a substantially vertical position when in contact with the said blank stack.

2. The device as set forth in claim 1 including means for holding down the top of the remaining portion of the stack of blanks until delivery of the top portion of the said stack is completed.

3. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks, comprising, a conveyor operable in synchronism with the said machine, a device above the conveyor to intercept and accumulate blanks issuing from the machine, said device including a pair of plates transverse to the direction of motion of the blanks between which the blanks may be accumulated; one of the said plates abuting the trailing edge of the blanks in the stack and being periodically oscillatorily movable in a longitudinal direction; an opening under said plate sufficient to permit the entry of at least one blank at a time, the other of said plates abuting the leading edge of the blanks in the stack and being longitudinally adjustable and, above the upper end of said plates a ~~longitudinally~~ continuously movable plate for periodically pushing a stack of said blanks from the said accumulating device, and means for supporting the said pusher plate so that it remains in a substantially vertical position when in contact with the said blank stack.

A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks, comprising, a conveyor operable in synchronism with the said machine, a device above the conveyor to intercept and accumulate blanks issuing from the machine, said device including a pair of plates transverse to the direction of motion of the blanks between which the blanks may be accumulated; one of the said plates abuting the trailing edge of the blanks in the stack and being periodically oscillatorily movable in a longitudinal direction; an opening under said plate sufficient to permit the entry of at least one blank at a time, the other of said plates abuting the leading edge of the blanks in the stack and being longitudinally adjustable, and above the upper end of said plates a longitudinally movable plate for periodically pushing a stack of said blanks from the said accumulating device, and means for providing the said pusher plate with an oscillatory longitudinal motion synchronized with the movement of the said conveyor so that the said plate moves forwardly in a lower position and rearwardly in an upper position.

5. A stacking, straightening and delivery mechanism comprising a conveyor operable in synchronism with the said machine, a device above the conveyor to intercept and accumulate blanks issuing from the machine, said device including straightening means transverse to the direction of motion of the blanks between which the blanks may be accumulated, one of the said plates abutting the trailing edge of the blanks in the stack and being periodically oscillatorily movable in a longitudinal direction; an opening under said plate sufficient to permit the entry of at least one blank at a time, and above the upper end of said plates a longitudinally movable plate for periodically pushing a stack of said blanks from the said accumulating device.

6. A stacking, straightening and delivery mechanism for transporting box blanks comprising a conveyor for moving the blanks into the mechanism, straightening means transverse to the direction of motion of the conveyor for confining a stack of blanks, one of the said blanks abutting the trailing edge of the blanks in the stack and being periodically oscillatorily movable ina longitudinal direction for aligning the blanks, and a common drive means for synchronizing the movement of the said conveyor, eccentrically movable plate and pusher plate so that the elements operate in a predetermined sequence.

7. The mechanism as set forth in claim 6 in which the conveyor causes the blanks to rise as they enter the mechanism thereby allowing them to be stacked from below.

8. The mechanism as set forth in claim 7 in which the pusher plate is supported so that it is substantially vertical at all times.

Case No. S-110

OATH, POWER OF ATTORNEY AND PETITION

Being duly sworn, I Albert F. Shields depose and say that I am a citizen of The United States of America residing at 43 Exeter Street Forest Hills, New York that I have read the foregoing specification and claims and I verily believe that I am the original, first and sole inventor of the invention or discovery of

BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

described and claimed therein, and that I do not know and do not believe that this invention was ever known or used before my invention or discovery thereof, or patented or described in any printed publication in any country before my invention or discovery thereof, or more than one year prior to this application, or in public use or on sale in the United States for more than one year prior to this application; that this invention or discovery has not been patented in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months before this application; and that no application for patent on this invention or discovery has been filed by me or my representatives or assigns in any country foreign to the United States, except as follows:

And I hereby appoint OSTROLENK, FABER, GERB & SOFFEN, a firm composed of Samuel Ostrolenk, Sidney G. Faber, Bernard Gerb and Marvin C. Soffen, of 10 East 40th Street, New York 16, New York, Registration No. 18,075 my attorneys or agents with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith.

Wherefore, I pray that Letters Patent be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, oath, power of attorney and this petition, this 7 day of November 1956.

Signature of Inventor Albert F. Shields
First Name Middle Initial Last Name

Post Office Address 43 Exeter Street
Forest Hills, New York

STATE OF New York)
COUNTY OF Kings) SS:

Before me personally appeared Albert F. Shields to me known to be the person described in the above application for patent, who signed the foregoing instrument in my presence, and he made oath before me to the allegations set forth therein as being under oath, on the day and year aforesaid.

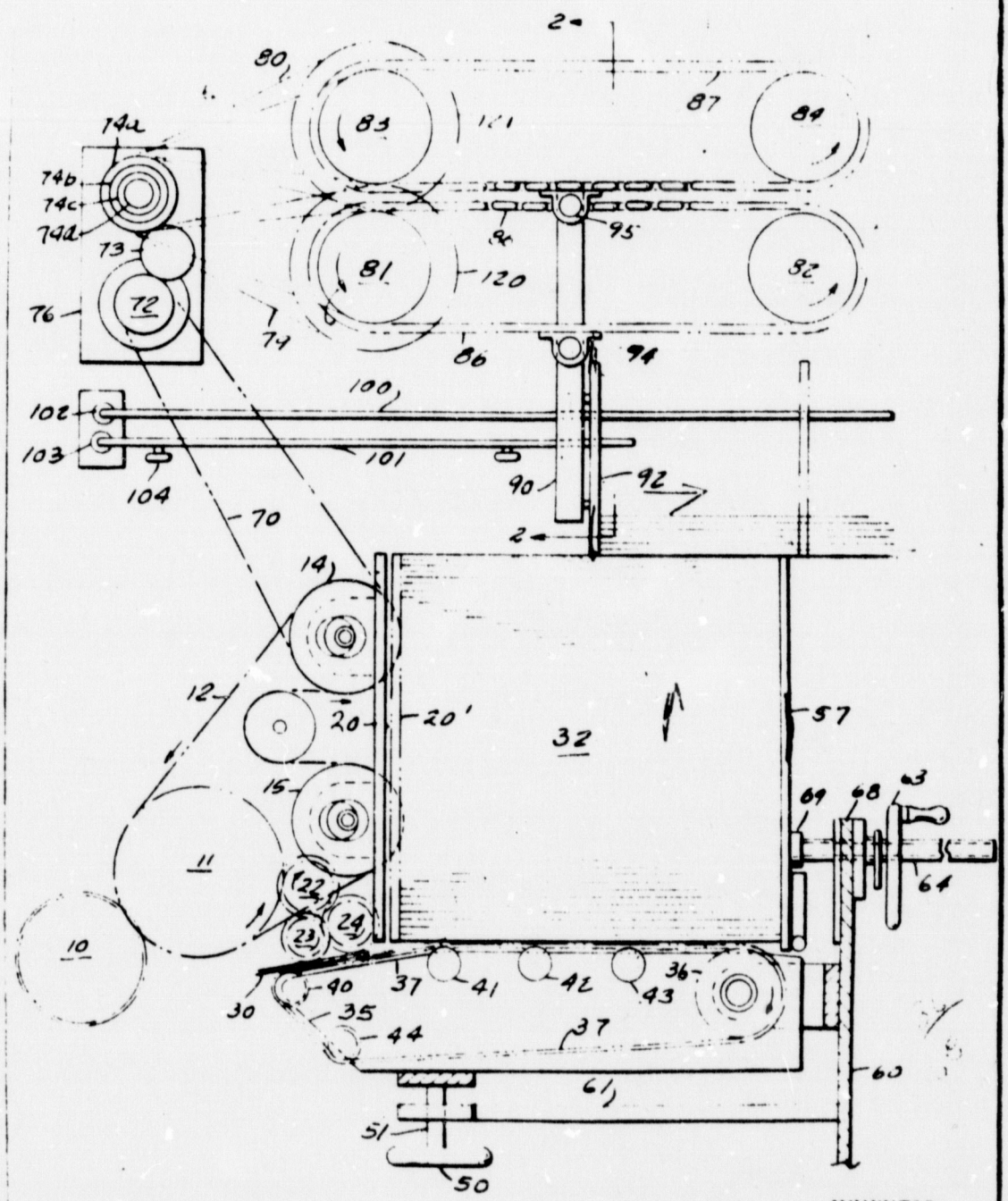
RUSSELL N. BANTA
Notary Public, State of New York
Qualified in Kings County
No. 21-5170100
Cert. Filed with Kings Co. Reg. Office
Commission Expires March 30, 1958

Russell N. Banta
Notary Public - Seal

14

ORIGINALLY FILED

FIG. 1.

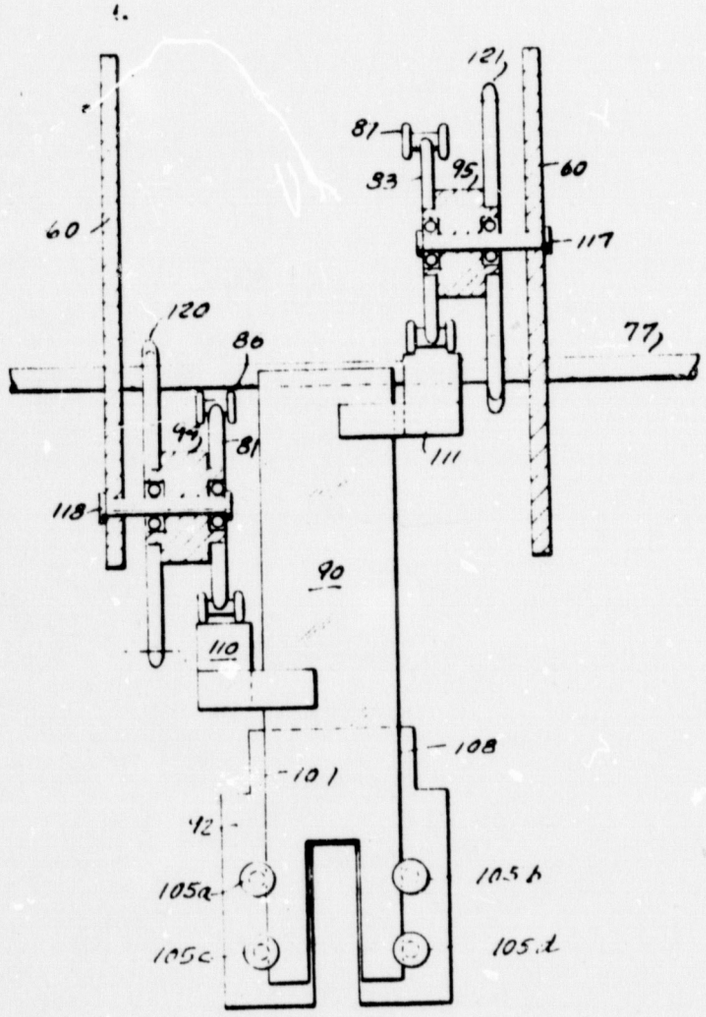


INVENTOR.
ALBERT F. SHIELDS

BY Strauch Nolan, Neale & Hoffman
ATTORNEYS

OCT 21 1960

FIG. 2.



INVENTOR.
ALBERT F SHIELDS
BY Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

POL-90
Rev.

ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON 25, D. C.

U. S. DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

PAPER NO. 3

Ostrolenk, Faber, Gerb & Soffen
10 East 40th St.
New York 16, New York

Applicant: Albert F. Shields
Ser. No. 626,100
Filed Dec. 4, 1956
For BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

MAILED
JUL 30 1957
PAT. OFF.
DIV 35

16—68457-8 GPO

Please find below a communication from the EXAMINER in charge of this application.

Robert C. Watson
Commissioner of Patents.

This application has been examined.

References of Interest:

Hudson	1,819,841	Aug. 18, 1931	271/87
Greenwood	1,868,384	July 19, 1932	271/87
Chandler	2,672,079	Mar. 16, 1954	214/6x
Payne	2,708,863	May 24, 1955	93/93.3

The office Draftsman has approved the drawings. The Examiner finds several discrepancies.

Idler wheel 17 is not numbered on the drawing. Space 31 is not shown. Shaft 117 in Fig. 2 should be shaft 119. Bushings 94 and 95 should be indicated in Fig. 2. Numeral 110 in Fig. 2 indicates the incorrect element. Rails 107 and 108 are not shown in either Figure. The cooperation between wheels 105 and rails 107 and 108 is not understood from the specification. The description would be helped by a showing in the drawings.

How does the pusher plate rise in response to the movement of the top of the stack through rails 107 and 108 and wheels 105? How do hold down strips 100-101 function? The examiner understands that "60" is used to indicate the frame of the machine generally. In line 26 page 4 wheel 50 is said to be mounted at 60. The description is indefinite.

Fig. 2 shows 77 as a horizontal shaft. Fig. 1 does not show it, yet it is associated with claims 79 and 80 in the specification where it is designated a "shaft wheel". What is it? It should be shown in Fig. 1.

The application has not been checked to the extent necessary to determine the presence of all errors. It is the responsibility of applicant to correct any errors which may appear in the specification or drawings.

Claims 1 to 8 are rejected as based on an indefinite disclosure for the reasons given herein above.

Claim 1 is further rejected as indefinite. "Longitudinal" is a relative term. When used, its relation to other elements must be set out. In line 9 and 12, it is used to describe movable plates. Does "longitudinal" mean the longitudinal axis of the plate - or some other element?

Claim 3 to 8 are rejected as indefinite for the same reasons that claim 1 was rejected.

Claim 5 calls for "said machine" in line 2.. There is no antecedant "machine" set out. The eccentrically movable plate and pusher plate have no relation to the rest of the claim. They are merely catalogued elements.

All claims are rejected.

RLWonder/chh

Art Unit Examiner

MAIL DIVISION
JAN 23 1958
U.S. PATENT OFFICE

PAPER NO 4

S-110

JAN 27 1958

IN THE UNITED STATES PATENT OFFICE

DIV. 35

In re application of

Albert F. Shields

Serial No. 626,100

Filed December 4, 1956

For: BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

- - - - - - - - - - - - - - - - - -

New York, New York

January 17, 1958

Division (35)

Hon. Commissioner of Patents

Washington 25, D.C.

Sir:

Responsive to the Office Action dated July 30, 1957 please amend the above identified application as follows:

In the Specification

Page 3, line 6 - please cancel "accmlating" second occurrence and substitute therefor -- accumulating --.

line 15 - after "plates" please insert -- between --.

Page 4, line 26 - please cancel "at"

Page 5, line 20 - please cancel "wheel"

line 21 - after "carries" please insert -- sprocket wheels 30,131 engaged by --.

Page 6, line 14 - after "means." please insert -- Hold-down strips 100 and 101 maintain a downward pressure on stack 32 thereby maintaining the folds in the blanks of stack 32 during both the delivery and accumulating periods. During the delivery period when the stack being removed clears the free end of the shorter strip 101, the strip 101 is now in position to engage the top of the remaining stack as it advances upward. During this period the longer strip 100 remains in engagement with the top of the stack being removed.

line 19 - after "d" please insert -- ,mounted to pusher plate 92, --.

line 20 - please cancel "respectively." and substitute therefor -- respectively, mounted to support plate 90. --

line 22 - please cancel "by means" and substitute therefor -- because --.

line 24 - after "the" ~~second~~ third occurrence please insert -- portion of the stack not being delivered. --

line 24 - please cancel "stack."

line 24 - after "delivered" please insert -- Thus the pusher plate does not interfere with the increasing stack even during the delivery period. A suitably positioned stop (not shown) is included to limit the downward movement of plate 92.

In the Claims

Claims 1, 3, 4, line 4 - after "machine," please insert -- to move said blanks in a first, or longitudinal, direction --.

Claim 5, line 2 - before "comprising" please insert -- adapted for use with a machine for operating on box blanks, --.

line 3 - after "machine" please insert -- to move said blanks in a first, or longitudinal, direction --.

line 5 - after "means" please insert -- comprising a pair of plates positioned --.

line 13 - please cancel "period (.) and substitute therefor --, said longitudinally movable plate being operated in synchronism with said machine --

Claim 6, line 3 - after "blanks" please insert -- in a first, or longitudinal, direction --.

REMARKS

Claims 1-18 remain in this application. Each has been amended to overcome their rejections as being indefinite. For example, Claim 1 now recites the conveyor as being operable to move the blanks in a "first, or longitudinal, direction." The expression "longitudinal" is not used in the alternative but rather is a modification of the expression "first direction." It is believed that the other recitations in the claims of "longitudinal" and "longitudinally" are now fully

explained so that the rejection based on indefiniteness has been overcome. The remainder of the claims have been similarly amended. In addition, Claim 5 has been amended so that the phrase "said machine" now finds antecedent support. Claim 5 has also been amended to recite "said longitudinally movable plate being operated in synchronism with said machine." It is believed that this amendment serves to tie the elements of Claim 5 together in a cooperating relationship.

A separate letter is enclosed herewith, addressed to the Chief Draftsman, requesting amendments to the drawings.

The applicant wishes to thank the Examiner for the many helpful suggestions he has made in connection with informalities in the specification and drawings. The last paragraph of page 6 has been amended to more clearly describe the cooperation between wheels 105 and rails 107,108. As the stack of box blanks rises passed the top of the straightening plates, pusher plate 92 moves to the right with respect to Figure 1 so that the top of the stack is engaged by the pusher plate and the top of the stack is moved to the right with respect to Figure 1. While the pusher plate is passing between the straightening plates, the bottom portion of the stack is moving upward against the bottom edge of the pusher

plate. The cooperation of wheels 105 guided by rails 107, 108 permits pusher plate 92 to rise and thereby prevents an excess downward force from acting on the lower portion of the stack. Thus the straightening plates operate under essentially the same conditions during both the accumulating and the delivery periods.

The first paragraph begining on page 6 has been amended to include a short explanation of the function of resilient hold-down strips 100,101 as requested by the Examiner. Because of these amendments, it is believed that the rejection of Claims 1-8 as being based on an indefinite disclosure is no longer valid. The Examiner's attention is called to the fact that while some portions of the amendments appear lengthy they do not introduce any new matter but merely amplify what was included in the specification and/or drawings as originally filed.

The patents cited were not applied against the claims. These patents have been examined and found not to anticipate the claims.

Accordingly, reconsideration and allowance of amended Claims 1-8 is respectfully requested.

Respectfully submitted,

OSTROLENK,FABER,GERB & SOFFEN

BY Marvin C. Soffen

MAIL DIVISION
JAN 23 1958
U.S. PATENT OFFICE

S-110

IN THE UNITED STATES PATENT OFFICE

In re application of

Albert F. Shields

Serial No. 626,100

Filed December 4, 1956

For: BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

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New York, New York

January 17, 1958

Division 35

PAPER NO 5
JAN 27 1958
DIV. 35

Hon. Commissioner of Patents

Washington 25, D. C.

Att: Chief Draftsman

Sir:

Please amend Figures 1 and 2 in the above identified application as indicated in red on the attached copies of the drawings.

Please charge the cost of these corrections to our account.

Respectfully submitted,

OSTROLENK, FABER, GERB & SOFFEN

By Marin C. Soffen

OK RLW

FIG. 1

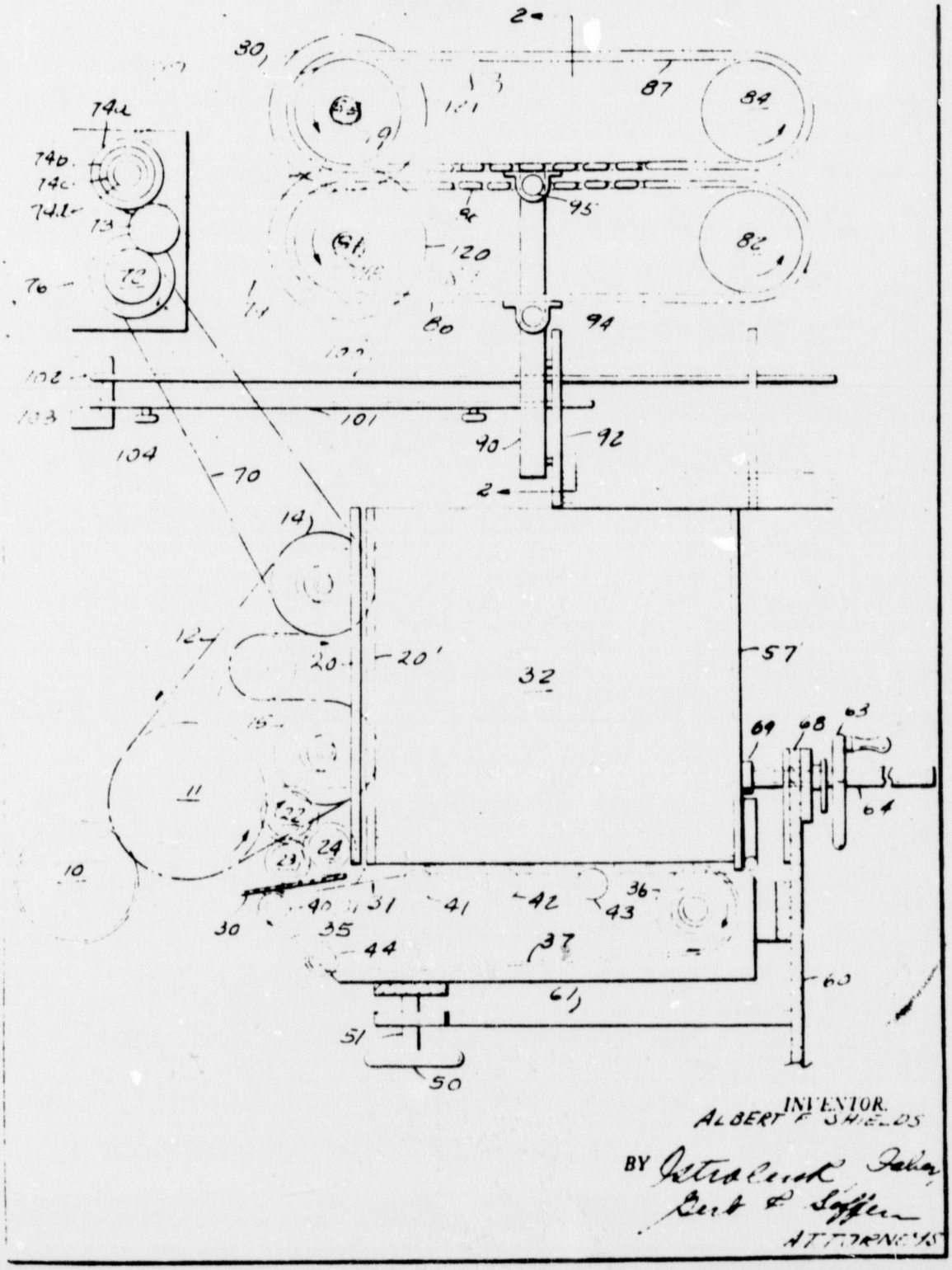
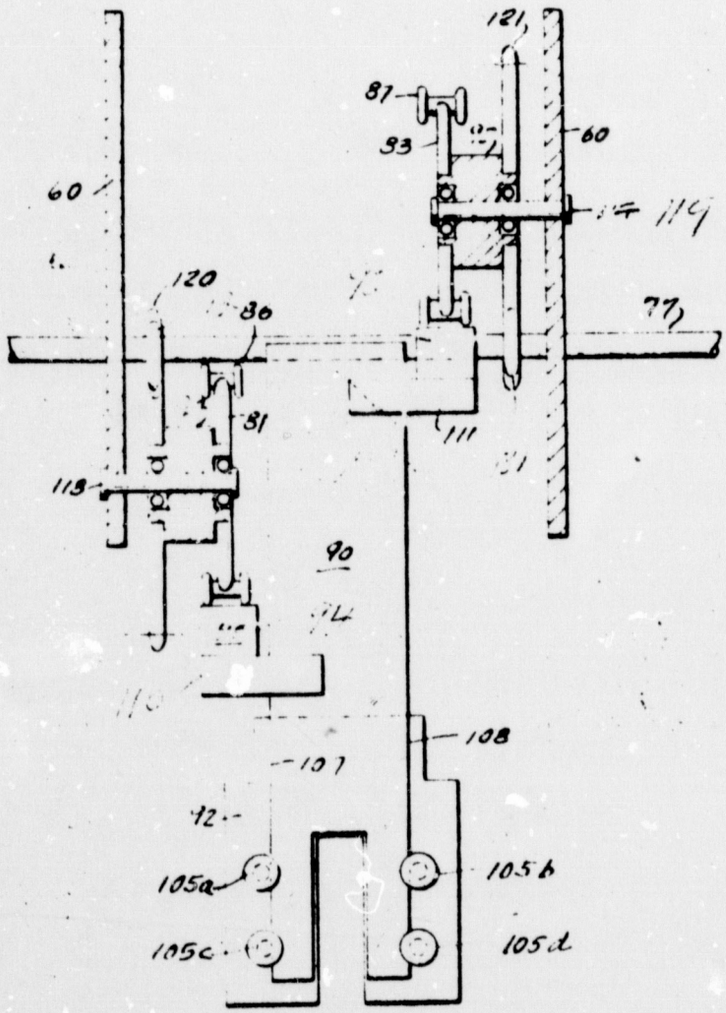

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INVENTOR.
ALBERT F. SHIELDS
BY Peter Cook Rehm
Dort & Saffren
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FIG. 2.



INVENTOR.
ALBERT F SHIELDS
BY Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

POL-90 *Rev.

ADDRESS ONLY THE COMMISSIONER OF PATENTS WASHINGTON 25, D. C.

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

PAPER No. 6

Ostrolenk, Faber, Gerb & Soffen
10 East 40th St.
New York 16, N. Y.

Applicant: Shields, Albert F.	MAILED
Ser. No. 626,100	JUL 7 1958
Filed Dec. 4, 1956	PAT OFF
For BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE	GROUP 4

16—68457-4 GPO

Please find below a communication from the EXAMINER in charge of this application.

Robert C. Watson
Commissioner of Patents.

Responsive to amendment filed January 23, 1958.

References:

Taylor	739,121	Sept. 15, 1903	271-89
Binkard	478,079	July 5, 1892	271-89
Hess	2,591,259	Apr. 1, 1952	214-8.5F
Lowd	1,755,884	Apr. 22, 1930	271-86

Pertinent art:

		(Filed Oct. 12, 1950)	
Link	2,789,067	Apr. 16, 1957	214-82x
Tascher	2,315,670	Apr. 6, 1943	198-24x
Temple	2,823,811	Feb. 18, 1958 (filed June 29, 1955)	198-24x

Operation of applicant's device is still questioned. How is the slapper 20 attached to the wheels 14 and 15 and how is it made to oscillate? How do the knobs 104 adjust the holddown strip? Also, the operation of the holddown strips is still not adequately disclosed. They should be shown in Fig. 2. Why is pusher 92 shown to be on one side of plate 90 in Fig. 1 and on the other side of 90 in Fig. 2? The stop means for 90 should be shown.

Claims 1-8 are rejected as being drawn to a device, the operation of which is inadequately disclosed for the reasons stated above.

Claims 6-8 are further rejected as being indefinite. Lines 5 and 6 of claim 6 are meaningless.

Inasfar as they are understood, claims 1 and 3-8 are rejected as unpatentable over Greenwood in view of Binkard or Taylor and Hess or Chandler. Greenwood shows a box blank stacker which operates in the same manner as applicant's device. Either Binkard or Taylor is relied upon to show a jogger. Note 16 of Taylor and "D" of Binkard. Either Hess or Chandler show ejectors. Note 41 of Hess and 146 of Chandler. In view of these teachings, no invention would be involved in making Greenwood's plate 19 capable of oscillatory movement as shown by either Taylor or Binkard, nor would invention be involved in providing Greenwood's device with an ejector as shown by either Hess or Chandler. All of these expedients are within the skill of the average mechanic and would not produce any new or unobvious results.

Claim 2 is rejected for the same reasons as claim 1 in view of Lowd. Lowd shows holddown means 3 for cards B and retaining means and for cards "C". In view of this teaching no invention would be involved in providing Greenwood's device with a holddown means for his box blanks "d".

No claim is deemed allowable.

E. C. Fallon
Examiner

PLHenry/cmw

U. S. PATENT OFFICE
6625
JAN 6 1959
DIVISION 4

S-110

IN THE UNITED STATES PATENT OFFICE

In re application of Albert F. Shields

Serial No. 626,100

Filed: December 4, 1956

For: BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

New York, New York

December 29, 1958

Division 4

Hon. Commissioner of Patents

Washington 25, D.C.

Sir:

Responsive to the Office Action dated July 7, 1958 please amend the above identified application as follows:

In the Specification

Page 4, line 7 - please cancel "eccentrically mounted"

line 8 - after "17." please insert -- Brackets 14a, 15a extending rearward from clapper plate 20 are mounted to eccentrics 14', 15', respectively, which are mounted to wheels 14, 15, respectively. --

Page 5, line 11 - please cancel "accentric" and substitute therefor -- wheel --.

Page 6, line 13 - please cancel "These strips are" and substitute therefor -- The strip 101 is --.

line 13 - after "of" please insert -- a telescoping section (not shown) which is held in place by --.

Page 7, line 3 - after "60." please insert -- Lugs 150, 151 projecting from pusher plate 92 are positioned to engage ears 152, 153 respectively, of support member 90 to thereby limit the downward movement of pusher plate 92. --

In the Claims

Claim 3, line 14 - please cancel "longitudinally" and substitute therefor -- continuously--.

line 15 - after "plate" please insert -- longitudinally movable --.

Claim 5, line 7 - please cancel "semi-colon" (;) and substitute therefor -- in a stack;--.

line 12 - after "movable" please insert -- vertically extending --.

line 13 - after "a" please insert -- top portion of said --.

line 13 - after "device" please insert -- while the bottom portion of said stack remains in said device, --.

Claim 5 - after last word in claim please cancel "period" (.) and substitute therefor -- ,said plate having the bottom edge thereof resting upon the top of said bottom portion of said stack while said top portion is being removed by said plate, said conveyor being timed to deliver said blanks to the bottom of said stack while said plate is removing the top portion of the stack. --

Claim 6, line 3 - after "means" please insert -- comprising a pair of plates --.

line 5 - please cancel "blanks" second occurrence and substitute therefor -- plates --.

line 8 - after "blanks," please insert -- a continuously movable pusher plate periodically engageable with a top portion of said stack for removal thereof, --.

REMARKS

Claims 1-8 are presently found in this application with Claims 3 and 5 having been amended to more clearly distinguish applicant's invention over the teachings of the references.

Enclosed herewith is a separate letter, addressed to the Chief Draftsman, requesting amendments to figures 1 and 2.

It is believed that the amendments to page 4 clearly set forth the means by which plate 20 is oscillated. The amendment to page 6, line 13 explains the operation of knobs 104. Figure 2, as amended, now illustrates the hold-down strips as well as a stop means for support 90. The section lines 2-2 have been repositioned in figure 1 so that the position of pusher 92 in figure 2 is consistent with the illustration of figure 1.

Claims 1-8 were rejected as being drawn to a device, the operation of which was inadequately disclosed. It is believed that the amendments to the specification and drawings overcome this rejection. It is to be noted, that these amendments have been made without the introduction of new matter since the specific amendments merely describe structure illustrated in the drawings as originally submitted.

Claims 6-8 were rejected as being indefinite with the Examiner particularly questioning lines 5 and 6 of Claim 6. It is believed that the amendment to Claim 6 successfully overcomes this rejection.

Claims 1 and 3-8 were rejected as being unpatentable over Greenwood in view of Binkard or Taylor and Hess or Chandler. It is conceded that the Greenwood patent illustrates a stacking device in which sheets are fed to a stack from beneath and it is further admitted that the Binkard and Taylor patents disclose an oscillating means for straightening sheets in a stack. However, it is submitted that neither the Taylor nor Binkard oscillating members can be combined with the Greenwood device so as to produce an oscillable plate suitable for a high speed stacking and straightening device as set forth in the claims.

The Hess and Chandler patents are relied upon for a showing of an ejector means. Claims 1, 3 and 8 each recite means for supporting applicant's pusher plate in a vertical position. Claims 3 and 6-8 recite the pusher plate as being continuously movable, while Claim 4 recites the pusher plate as being movable in an upper and a lower position and when movable in the lower position engaging the top portion of the stack.

Amended Claim 5 recites the stack as being fed even as the delivery process is going on.

The ejection means of both the Hess and Chandler patents are operated intermittently thereby making them totally unsuited for a high speed stacking device such as illustrated in the instant application. That is, a member operated intermittently under conditions of high impact loading will soon fail. Further, neither the Hess nor Chandler ejector means is constructed so as not to interfere with the stack which is rising even as the ejecting operation is taking place. None of the other limitations relative to the pusher plate are taught or remotely suggested by the references.

In view of the foregoing, Claims 1 and 3-8 are not anticipated by, and are patentable over, the teachings of the patents to Greenwood, Binkard, Taylor Hess and Chandler when taken alone or in combination.

Claim 2 was rejected for the same reasons as Claim 1 in view of Lowd. There is no teaching whatsoever in the Lowd patent of a hold-down means which will permit the top of the stack to be removed while enabling the stack to increase in size from below. Therefore, Claim 2 patentably distinguishes

over the combination of the references cited thereagainst.

The patents to Link, Tascher and Temple cited, but not applied against the claims, have been examined and been found not to supply any of the deficiencies noted in connection with the applied references.

Accordingly, reconsideration and allowance of Claims 1-8 is respectfully requested.

Respectfully submitted,

OSTROLENK FABER GERB & SOFFEN

BY J. Berliner

JMB:dr

S-110

IN THE UNITED STATES PATENT OFFICE

In re application of
Albert F. Shields
Serial No. 626,100
Filed: December 4, 1956

For: BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

- - - - - - - - - - - - - - - - - - - -

New York, New York
December 29, 1958
Division 4

U. S. PATENT OFFICE
JAN 6 1959
DIVISION 4

Hon. Commissioner of Patents
Washington 25, D. C.

Attention:Chief Draftsman

Sir:

Kindly amend Figures 1 and 2 as indicated in red on the enclosed copies of the drawings.

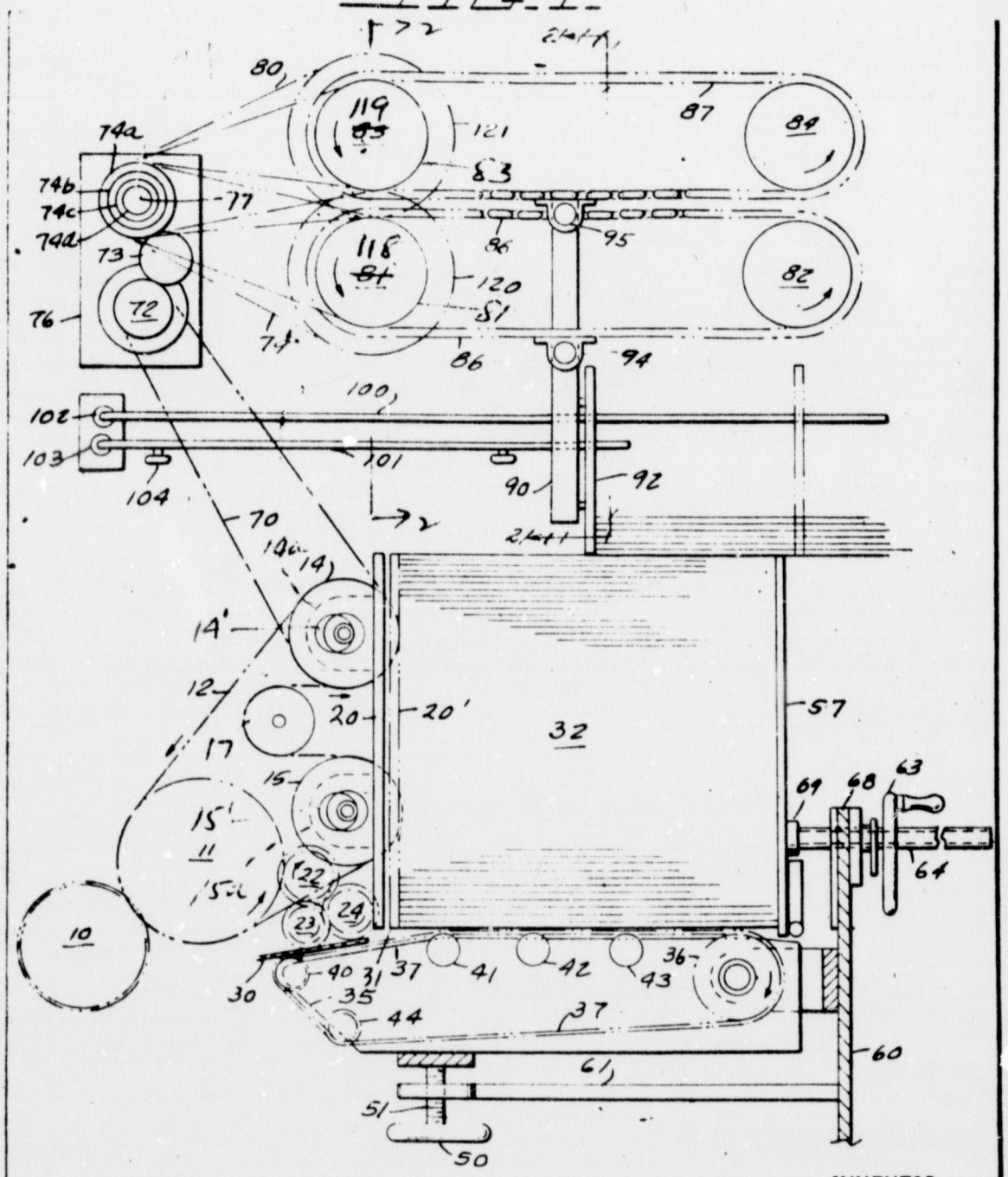
Kindly charge cost of same to our account.

Respectfully submitted,
OSTROLENK FABER GERB & SOFFEN

BY J Berliner

CORRECTED
SEP 9 1960

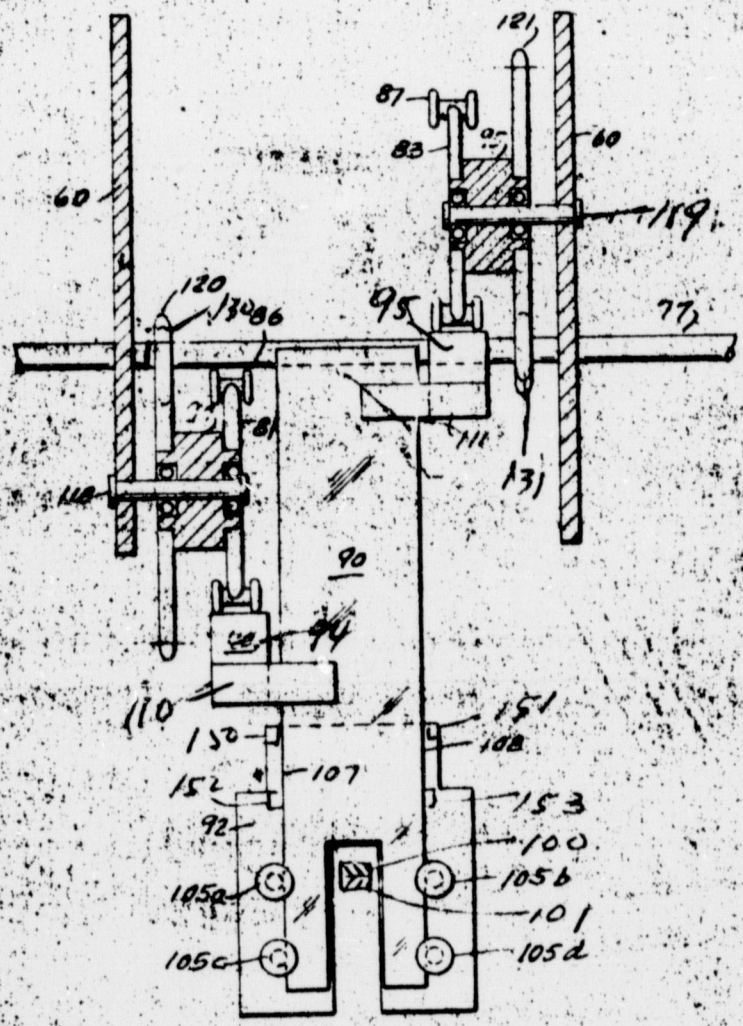
FIG. 1



INVENTOR.
ALBERT F. SHIELDS

BY Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

FIG. 2.



INVENTOR
ALBERT F. SHIELDS

BY Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

ONLY COPY AVAILABLE

POL-90
Rev.
ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON 25, D. C.

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

PAPER NO. 9

Ostrolenk, Faber, Gerb
& Soffen
10 East 40th St.
New York 16, N. Y.

Applicant: Shields, Albert F.	
Ser. No. 626,100	
Filed Dec. 4, 1956	APR 29 1959
For BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE	DIV 4

16—68457-4 GPO

Please find below a communication from the EXAMINER in charge of this application.

Robert C Watson
Commissioner of Patents.

Responsive to amendment filed December 30, 1958.

References:

Trevette	635,616	Oct. 24, 1899	271/43
Hart	1,344,034	June 22, 1920	214/8.5Fx
Sheppard	2,135,773	Nov. 8, 1938	198/10
Link et al.	2,853,299	Sept. 23, 1958 (filed Apr. 5, 1954)	271/89x

Pertinent art

Jamieson et al.	2,410,380	Oct. 29, 1946	198/174x

Claims 1 and 5 are rejected as being unpatentable over Greenwood in view of Link et al. and Hart. Link shows a rear jogging device 96 and a stationary front plate 104 for the purpose of aligning sheets in a stacking device. Hart shows pushing means 58 operatively connected to a stacking means, said pushing means ejected a predetermined number of objects in a given interval of time. In view of these teachings, no inventive skill would be involved in providing Greenwood's stacking device with Hart's pusher means nor in modifying Greenwood's plate 19 by imparting oscillatory motion to it as shown by Link et al. as these expedients would be within the skill of the average mechanic and would not produce any new or unobvious results.

Claim 2 is rejected for the same reason as claim 1 furtner in view of Trevette who shows holddown means "z" for holding down a stack of sheets while the top one is being removed. This clear teaching could be incorporated into the basic reference without invention but merely the exercise of mechanical design skill. (See also the flexible holddown means 186 of Link et al.)

Claims 3, 4, and 6-8 are rejected for the same reasons as claim 1 further in view of Sheppard who shows a continuously moving pusher actuated by an endless chain drive equivalent to that disclosed by applicant. No invention would be involved in substituting Sheppard's pusher for Hart's pusher as this expedient would be within the skill of the average mechanic and would not produce any new or unobvious results. Furthermore, no invention would be involved in mounting Sheppard's sprockets 4 on horizontal axes if this were desired so as to give the pusher a movement limited to a vertical and horizontal direction .

The proposed corrections to the drawings are acceptable but will be held in abeyance pending the allowance of any claim.

No claim is deemed allowable.

P. L. Henry
Examiner

PLHenry/cmw

MAIL ROOM OCT 26 1959 PATENT OFFICE

U.S. PATENT OFFICE 8639 OCT 28 1959

IN THE UNITED STATES PATENT OFFICE

In re application of

Albert F. Shields

Serial No. 626,100

Filed: December 4, 1956

For: BLANK STACKING STRAIGHTENING AND DELIVERY DEVICE

New York, New York

October 23, 1959

Division 4

Hon. Commissioner of Patents

Washington 25, D.C.

Sir:

In response to the Office Action dated April 29, 1959 please amend the above identified application as follows:

In the Claims

Cancel Claims 3-8.

Claim 2, line 3 - please cancel 'period' (.) and substitute therefor ; and also exerting a hold-down force to the blanks remaining in the accumulating device during delivery of said stack.

Please Add the Following Claims

3. A stacking, straightening and delivery mechanism adapted for use with a machine for operating box blanks, comprising a conveyor operable in synchronism with the said machine to move said blanks in a first or longitudinal direction, a device above the conveyor to intercept and accumulate blanks issuing from the machine, said device including straightening means comprising a pair of plates positioned transverse to the direction of motion of the blanks between which the blanks may be accumulated in a stack; one of the said plates abutting the trailing edge of the blanks in the stack and being periodically oscillatorily movable in a longitudinal direction; an opening under said plate sufficient to permit the entry of at least one blank at a time, and above the upper end of said plates a longitudinally movable vertically extending pusher plate for periodically pushing a top portion of said stack of said blanks from the said accumulating device while the bottom portion of said stack remains in said device, said pusher plate being operated in synchronism with said machine, said plate having the bottom edge thereof

Claim 9 (cont.)

resting upon the top of said bottom portion of said stack while said top portion is being removed by said plate, said conveyor being timed to continue delivery of blanks to the bottom of said stack while said pusher plate is removing the top portion of the stack; a support plate carrying said pusher plate; said pusher plate being vertically movable relative to said support plate.

4 ~~10.~~ A stacking, straightening and delivery mechanism for transporting box blanks comprising a conveyor for moving the blanks in a first, or longitudinal, direction into the mechanism, straightening means comprising a pair of plates transverse to the direction of motion of the conveyor for confining a stack of blanks, one of the said plates abutting the trailing edge of the blanks in the stack and being periodically reciprocally ~~oscillatorily~~ movable in a longitudinal direction for aligning the blanks; a continuously movable pusher plate periodically engageable with a top portion of said stack for removal thereof, and a common drive means for

Claim 10 (cont.)

synchronizing the movement of the said conveyor, said ~~eccentrically~~ reciprocally movable plate, and said pusher plate so that the elements operate in a predetermined sequence, a support plate for maintaining said pusher plate substantially vertical at all times, said pusher plate mounted to said support plate for vertical movement relative thereto.

add 2

REMARKS

Claims 1 and 2 together with newly submitted claims 9 and 10 are presently found in this application with claim 2 having been amended to more clearly distinguish applicant's invention over the teachings of the references. Claims 3-8 have been cancelled without prejudice by this amendment.

Newly submitted claims 9 and 10 are clean copies of cancelled claim 5 and 8, respectively, amended to recite additional details of the delivery device.

Claims 1 and 5 were rejected as being unpatentable over Greenwood in view of Link, et al and Hart with the Examiner feeling that "no inventive skill would be involved in providing Greenwood's stacking device with Hart's pusher means nor in modifying Greenwood's plate 19 by imparting oscillatory motion to it as shown by Link, et al. as these expedients would be within the skill of the average mechanic and would not produce any new or unobvious results."

The instant invention, as recited in claims 1 and 9, provides a novel means for stacking and straightening folded box blanks as they are delivered from a folder gluer and thereafter delivering portions of the stack. The device of the Greenwood patent merely provides means for forming a stack by adding blanks thereto from the bottom as is done in the applicant's device. However, no means is provided for straightening inaccurately folded blanks.

In the device of the Link, et al patent a stack is formed by adding sheets to the top thereof. The jogging device 96 of the Link et al patent merely provides means for moving the sheets of the stack

into an orderly arrangement. There is no teaching or suggestion that the jogging device may be utilized to align the panels of an improperly folded tubular box. Further, there is no teaching or suggestion that the jogging device 96 may be utilized as a means for supporting a stack which is being fed from below. From the foregoing, it is obvious that there is no logical reason why the "average mechanic" would combine the teachings set forth in the Greenwood and Link, et al patents in an attempt to produce a stacking and straightening device.

Each of the claims 1 and 9 recite structure for forming a stack which is fed from below while straightening the blanks of the stack. This structure is recited as including a plate which abuts the trailing edge of the blanks and is periodically oscillatorily movable in a longitudinal direction.

The newly submitted claim 9 contains an additional limitation directed to the delivery device and recites the device as comprising a pusher plate mounted to a support plate with the pusher plate being vertically movable relative to the support plate. Neither the Hart patent, cited against claim 5, nor the Sheppard patent, cited against

others of the claims disclose a structure of this nature.

In view of the foregoing, it is believed that claim 1 and newly submitted claim 9 patentably distinguish over the teachings of the Greenwood, Link, etal, Hart and Sheppard patents when taken alone or in combination.

Claim 2 was rejected for the same reason as claim 1 in view of Trevette. Claim 2 depends from claim 1 and has been amended to recite that the hold-down means acts on the stack being delivered as well as on the blanks remaining in the accumulating device during delivery of the stack. The Trevette element Z only applies a hold-down force to the portion of the stack which is not being removed. Therefore, amended claim 2 is not anticipated by a combination of the patents to Greenwood, Link, et al, Hart and Trevette.

Claim 8 which has been replaced by newly submitted claim 10 was rejected for the same reason as claim 1 in view of Sheppard. Claim 10 includes the limitation of newly submitted claim 9 directed to the pusher plate and its vertical movement relative to its support plate. As previously noted, this limitation is not taught or remotely suggested by Sheppard. In

addition, newly submitted claim 10 contains all of the distinguishing limitations noted in the arguments supporting claim 1. Therefore, newly submitted claim 10 patentably distinguishes over the patents to Greenwood, Link, et al, Hart and Sheppard when taken alone or in combination.

Accordingly, reconsideration of claims 1 and 2 and consideration of newly submitted claims 9 and 10, together with allowance of each of these claims is respectfully requested.

Respectfully submitted,

OSTROLENK FABER GERB & SOFFEN

BY _____

POL-90 Rev.

ADDRESS ONLY THE COMMISSIONER OF PATENTS WASHINGTON 25, D. C.

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

PAPER NO. 11

Ostrolenk, Faber, Gerb & Soffen
10 East 40th St.
New York 16, N. Y.

Applicant: Albert F. Shields	
Ser. No. 626,100	
Filed: Dec. 4, 1956	JUN 28 1960
For: BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE	DIV. 4

16—68457-4 GPO

Please find below a communication from the EXAMINER in charge of this application.

Robert C. Watson
Commissioner of Patents.

Responsive to amendment filed October 26, 1959.

Claims 1, 2, and 10 are rejected as being indefinite. Claim 1 and dependent claim 2 do not point out and distinctly claim the subject matter of the invention in accordance with 35 USC 112. It is not evident from the defined combination what cooperative or useful function the contact of the pusher has with the blank stack. The novelty of the invention appears to reside in the vertically movable pusher plate so that the blanks can continuously accumulate while the pusher plate is removing a top portion of the stack. It is suggested that the word --accumulating-- be inserted after the word "said", line 16, claim 1. This indicates some functional purpose of the contact of the pusher with the blank stack. In claim 10, no antecedent for the "said eccentrically movable plate" is found.

It is suggested that the word --reciprocally-- is a more appropriate word than "oscillatorily" to define the movement of the plate 29.

Claims 1, 2, and 10 stand rejected.

Claim 9 stands allowed.

This action is FINAL.

H. Schwartz
Acting Examiner

AUG 30 1960

S-110

IN THE UNITED STATES PATENT OFFICE

U.S. PATENT OFFICE SEP 6 1960

In re application of

Albert F. Shields — New York, New York

Serial No. 626,100 — August 26, 1960

Filed: December 4, 1956 — Division 4

For: BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

- - - - - - - - - - - - - -

Hon. Commissioner of Patents

Washington 25, D. C.

Sir:

Responsive to the Office Action dated June 28, 1960, kindly amend the above identified application as follows:

In the Specification

Page 4, line 8 - After "periodic" please insert -- reciprocating or --

In the Claims

Claim 1, line 5 - after "machine" please insert -- thereby forming a blank stack being fed from below --

Claim 1, line 9 - replace "oscillatorily" with -- reciprocally --

Claim 1, line 10 - after "direction" add -- to apply a straightening force to the blanks --

Claim 1, line 13 - after "a" insert -- top portion of the --

Claim 1, line 16 - replace period (.) with , said pusher plate being mounted for limited vertical movement relative to the means for supporting the pusher plate, said stock being fed with blanks as the movable plate is removing said top portion from the stack.

Claim 2, line 2 - after "of the" insert -- remaining portion of the --

Claim 2, line 3 - after "the" insert -- top portion of the --

Claim 10, line 9 - replace "oscillatorily" with -- reciprocally --

Please add the following new claim:

11. A stacking, straightening and delivery mechanism adapted for use with a machine for operating box blanks, comprising a conveyor operable in synchronism with the said machine to move said blanks in a first or longitudinal direction, a device above the conveyor to intercept and accumulate blanks issuing from the machine; said device comprising a first and a second means for engaging the blanks at the leading and trailing edges, respectively, thereof to thereby form a stack of blanks being fed from below; an opening under said second means sufficient to permit the entry of at least one blank at a time,

said device constructed and operated to apply a straightening force to the blanks in the stack, and above the upper end of said device a longitudinally movable vertically extending pusher plate for periodically pushing a top portion of said stack of said blanks from the said accumulating device while the bottom portion of said stack remains in said device, said pusher plate being operated in synchronism with said machine, said plate having the bottom edge thereof resting upon the top of said bottom portion of said plate, said conveyor being timed to continue delivery of blanks to the bottom of said stack while said pusher plate is removing the top portion of the stack; a support plate carrying said pusher plate; said pusher plate being vertically movable relative to said support plate.

R E M A R K S

Allowed claim 9 together with amended claims 1, 2 and 10 as well as new claim 11 are presently found in this case.

Applicant wishes to thank the Examiner for the courtesy extended to his attorney during the interview conducted on 18 August 1960.

Claims 1, 2 and 10 were rejected on formal grounds. They have now been amended to reflect the discussion which took place during the interview.

That is, these claims have been amended to recite that blanks are being fed to the stack while the top portion of the stack is being removed by the pusher plate. This is accomplished by mounting the pusher plate for a limited vertical movement relative to the means for supporting the pusher plate. This limitation is not taught or suggested by any of the references cited during the course of prosecution. It is submitted that claims 1, 2 and 10, as amended, now point out and distinctly claim the subject matter of applicant's invention in accordance with 35USC112. Therefore, it is believed that amended claims 1, 2 and 10 are patentable.

Newly submitted claim 10, which was presented to the Examiner during the course of the interview, corresponds substantially to allowed claim 9 except that the conveyor to intercept and accumulate blanks is recited much more broadly in new claim 11 than in allowed claim 9. In all other respects claims 9 and 11 are identical. Therefore, it is submitted that new claim 11 is allowable over the references when taken alone or in combination.

Accordingly, reconsideration of amended claims 1, 2 and 10, consideration of new claim 11, and allowance of each of these claims is respectfully requested. Allowance of claim 9 is again noted.

Respectfully submitted,
OSTROLENK FABER GERB & SOFFEN

JMB:JE

BY _____

POL-3 Plaintiffs' Exhibit 19 - File History - Shields's Patent In Suit E73

ADDRESS ONLY THE COMMISSIONER OF PATENTS WASHINGTON 25, D. C.

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

All communications regarding this application should give the serial number, date of filing and name of the applicant.

PAPER No. 13 / E

Ostrolenk, Faber, Gerb & Soffen
10 East 40th St.
New York 16, N. Y.

Applicant: Albert F. Shields	
Ser. No. 626,100	
Filed Dec. 4, 1956	
For BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE	

Please find below a communication from the EXAMINER in charge of this application.

Robert C Watson
Commissioner of Patents.

The changes hereinafter specified have been made in the application identified above in accordance with the provisions of Order Number 3141 of February 4, 1930, (Manual of Patent Examining Procedure 1302.04), which reads in part as follows:

> **Other obvious informalities in the application may be corrected by the examiner, but such corrections must be in the form of an amendment, approved and signed by the Principal Examiner, placed in the file, and made a part of the record. A copy of the amendment is sent to the applicant. The changes specified in the amendment will be entered by the clerk in the regular way.**

If these changes are not satisfactory to the applicant, an appropriate amendment may be proposed under the provisions of Rule 312, provided the printing of the specification has not begun at the time such amendment is ready for entry. To insure the consideration of such amendment for inclusion, it should be submitted on or before the date of remitting the final fee since the printing of the specification begins a few days thereafter.

The application has been amended as follows:

Claim 10, line 15, the word "accentrically" has been changed to --reciprocally--. The movable plate is described as reciprocally movable in lines 7-9; thus the amendment makes the terms of the claim

USCO1984-DC-38025

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(7-56)

Serial No. 828,100 Paper No. 14

REFERENCES CITED

8540

The following references are of record in the patented file of this patent:

UNITED STATES PATENTS

Name	Number	Date
Binkard	478,079	July 5, 1892
Trevette	635,616	Oct. 24, 1899
Taylor	739,121	Sept. 15, 1903
Hart	1,344,034	June 22, 1920
Loud	1,755,884	Apr. 22, 1930
Hudson	1,819,841	Aug. 18, 1931
Greenwood	1,868,384	July 19, 1932
Sheppard	2,135,773	Nov. 8, 1938
Tascher	2,315,670	Apr. 6, 1943
Jamieson et al.	2,410,380	Oct. 29, 1946
Hess	2,591,259	Apr. 1, 1952
Chandler	2,672,079	Mar. 16, 1954
Rayne	2,708,863	May 24, 1955

FOREIGN PATENTS

Country	Number	Date
Link	2,789,067	Apr. 16, 1957
Temple	2,823,811	Feb. 18, 1958
Link et al.	2,853,299	Sept. 23, 1958

OTHER REFERENCES

POL.-85
5-26-60

ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON 25, D. C.

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

NOTICE OF ALLOWANCE

The application for patent identified below has been examined and found allowable for issuance of Letters Patent.

	FILING DATE	SERIAL NO.	NO. OF CLAIMS ALLOWED	EXAMINER	DIV.
	12/04/56	626100	5	E. A. Faller	04
APPLICANT	Shields, Albert F., Forest Hills, N. Y.			MAILED Oct. 26, 1960	
ASSIGNEE	S & S Corrugated Paper Machinery Company, Inc.				
TITLE OF INVENTION	Blank stacking, straightening and delivery device				

With the allowance of the application the final fee becomes due. This fee is thirty dollars ($30) plus one dollar ($1) for each claim allowed in excess of twenty (20) and must be paid within 6 months from the date of this notice. Failure to remit the final fee will result in the patent being withheld from issue.

As a convenience in remitting this fee, use of the enclosed Form POL-85a is suggested. The final fee will not be received from anyone other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office. If no entry appears in the space labeled "assignee," above, a form is enclosed relating to the address of the inventor(s) which requires your attention.

If it is desired to have the patent issued to an assignee or assignees, an assignment, together with the fee for recording the same, must be filed in this Office on or before the date of payment of the final fee.

The patent will be issued and forwarded within approximately two months after receipt of the final fee.

By direction of the Commissioner.

Ostrolenk, Faber, et al
10 E. 40th St.
New York 16, N. Y.

Plaintiffs' Exhibit 19 - File History - Shields's Patent in Suit E76

POL-85A
8-26-58

U. S. Department of Commerce
Patent Office

FINAL FEE TRANSMITTAL

This form is provided for convenience in transmitting final fees to the Patent Office. When properly completed it may be used in lieu of a formal transmittal letter. Respondents will note and fill in items numbered 1 thru 6 below. The Final Fee Receipt, in all cases, will be mailed to the address appearing in box at lower left of this form. If desired, use the reverse side of your Notice of Allowance for carbon copy when completing this form.

1. The COMMISSIONER OF PATENTS is requested to apply the accompanying fee to the case identified below, and deliver the patent as indicated.

OSTROLENK FABER GERB & SOFFEN

April 24, 1961
Date

By Marvin C. Soffen
Attorney, Agent or Applicant

APR 25 1961 U.S. PATENT OFFICE

NOTE—Final fees will not be received from other than the applicant, his assignee, or attorney, or a party in interest as shown by the records of the Patent Office. Final fees will not be applied to pending applications.

	FILING DATE	SERIAL NO.	NO. OF CLAIMS ALLOWED	EXAMINER	DIV.
	12/04/56	626100	5	E. A. Faller	04
APPLICANT	Shields, Albert F., Forest Hills, N. Y.			MAILED Oct. 26, 1960	
ASSIGNEE	S & S Corrugated Paper Machinery Company, Inc.				
TITLE OF INVENTION	Blank stacking, straightening and delivery device			Notice of Allowance Date	

2. DEFERMENT: (Indicate below if desired)

3. FEE ENCLOSED

$ 30.00

4. Assignee: (If assigned and name does not appear in the corresponding space above)

APR 27 1961 130336 PAT OFF 115 30.00

MAILING INSTRUCTIONS

Note—The office will send the patent to the address entered in stub at left below unless you direct otherwise. Use the spaces provided to indicate any changes which affect the delivery of the patent.

5. Do not send the patent to the addressee listed below. Send patent to (check one)

☐ Patentee
☐ Assignee
☐ Associate Attorney (See specific authorization in file)
☐ Change of address—Attorney

The address of the person checked above is typed in Item 6 below.

6.

-59-

Plaintiffs' Exhibit 19 - File History - Shields's Patent in Suit E77

United States District Court

for the

Eastern Dist. of N.Y.

COMMISSIONER OF PATENTS,
Washington 25, D. C.

SIR: Brooklyn

In compliance with the Act of July 19, 1952 (66 Stat. 814; 35 [illegible]), you are advised that there was filed on the 24th day of July, 19 70, in this court an action, No. 70C-926, entitled:

Name KOPPERS COMPANY, INC. & ANO, Plaintiff,

Address Koppers Building, Pittsburgh, Pennsylvania 15219

versus

Name S & S CORRUGATED PAPER MACHINERY CO., INC., Defendant,

Address 160 North 4th Street, Brooklyn, New York

brought upon the following patents:

	PATENT NO.	DATE OF PATENT	PATENTEE
1	2,988,236	June 13, 1961	
2			
3			
4			
5			

In the above-entitled case, on the day of , 19 , the following patents have been included by (insert amendment, answer, cross bill, or other pleading):

	PATENT NO.	DATE OF PATENT	PATENTEE
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or judgment issued:

Clerk.

Date July 24, 19 70 By Brina J. Nicos
Deputy Clerk.

SEARCHED

Class	Sub	Date	Ex'r
271	50		
	54		
	60		
	62		
	69		
	84		
	87		
	89		
214	6		
	62		
	85A		
	85F		
	15		
	10.8		
93	93.3	1-24-57	RLW
5.14	8.5		
271	86	10/58	RLW
	87		
	89		
214	8...		

INDEX OF CLAIMS

Claim Final	Claim Original	Date								Claim Final	Claim Original	Date							
		7/24/57		4/58	6/60														
1	1	✓		✓	✓						61								
✓	2	✓		✓	✓						62								
	3	✓		✓							63								
	4	✓		✓	✓						64								
	5	✓		✓	✓						65								
	6	✓		✓							66								
	7	✓		✓	✓						67								
	8	✓		✓	✓						68								
4	9				11 ✓						69								
4	10				✓						70								
5	11										71								
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	13										73								
	14										74	1	+						
	15										75								
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3. REJECTION
4. Amdt A Jan. 23, 1958
5. Letter to "C" - print Jan. 23, 1958
6. REJECTION JUL 7 1958
7. Amdt. B Dec. 30, 1958
8. Ltr to [illegible] Dec. 30, 1958
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10. Amdt C - Oct. 26, 1959
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PLAINTIFFS' EXHIBIT 24 - LETTER DATED JUNE 4, 1969 FROM MESSRS. OSTROLENK FABER GERB & SOFFEN TO THEODORE LEY

E80

OSTROLENK, FABER, GERB & SOFFEN
ATTORNEYS AT LAW
10 EAST 40TH STREET
NEW YORK, N.Y. 10016

SAMUEL OSTROLENK
1898-1968

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BERNARD GERB
MARVIN C. SOFFEN
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JEROME M. BERLINER
LOUIS WEINSTEIN
MARC S. GROSS

ROBERT C. FABER
CHARLES I. BROOSKY
CHARLES J. METZ

PATENTS
TRADE MARKS
RELATED CAUSES

TELEPHONE
(212) 605-8470

CABLE:
OSTROFABER NEW YORK

A.B.G.
F.H.K.

RECEIVED
JUN 6 19[illegible]
ARTHUR B. COLVIN

PLAINTIFF'S EXHIBIT
TO 24 EVD
NO. 70-926

June 4, 1969

Mr. Theodore Ley, President
Universal Corrugated Box Machinery Corp.
Cranford, New Jersey

Re: S8.1-008 - Underfed Stacker-Straighteners
Universal

Dear Mr. Ley:

We represent the S&S Corrugated Paper Machinery Co., Inc., of Brooklyn, New York.

Our client has heard rumors to the effect that an underfed stacker-straightener with in-line delivery has been manufactured and/or installed in a box plant by Universal.

As you should be aware, S&S possesses an extensive patent position in the field of underfed stacker-straighteners with in-line delivery.

Accordingly, S&S is desirous of learning whether the rumors noted above are true, and if such rumors are true we would like the opportunity to examine the machine in question at the earliest opportunity.

We look forward to receiving your early reply to this letter.

Very truly yours,

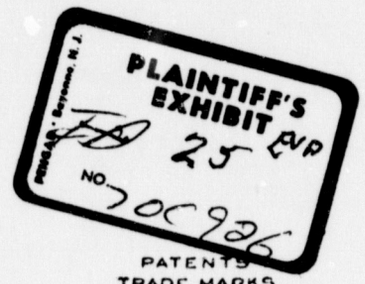
OSTROLENK FABER GERB & SOFFEN

Jerome M. Berliner

Jerome M. Berliner

JMB - jb
cc - Mr. Mitchel Flaum

PLAINTIFFS' EXHIBIT 25 - LETTER DATED MARCH 30, 1970 FROM OSTROLENK FABER GERB & SOFFEN TO ARTHUR B. COLVIN, ESQ. E81



OSTROLENK, FABER, GERB & SOFFEN
ATTORNEYS AT LAW
10 EAST 40TH STREET
NEW YORK, N.Y. 10016

SAMUEL OSTROLENK
1898-1968

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BERNARD GERB
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JEROME M. BERLINER
LOUIS WEINSTEIN
MARC S. GROSS

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CHARLES I. BRODSKY
CHARLES J. METZ

PATENTS
TRADE MARKS
RELATED CAUSES

TELEPHONE
(212) 685-6470

CABLE:
OSTROFABER NEW YORK

F.H.K.

762-241

March 30, 1970

RECEIVED
MAR 30 1970
ARTHUR B. COLVIN

Arthur B. Colvin, Esq.
Dean, Fairbank and Hirsch
521 Fifth Avenue
New York, New York 10017

Re: S8.1-008 - Underfed Stacker-Straightener
(Universal and S&S)

Dear Mr. Colvin:

Thank you very much for taking me to Universal's plant in New Jersey on March 6th to examine the latest version of Universal's underfed stacker-straightener.

I have restudied the S&S U. S. Patent No. 2,988,236, and conclude that the Universal equipment I examined comes within the literal language of patent Claim 1, as well as within the spirit of the invention described in the specification.

As I understand it, your viewpoint concerning validity and/or non-infringement focuses on the feed-out part of Universal's equipment, and is based on:

1. An asserted similarity between the cylinder operated mechanisms of the Universal equipment and the Gjostein U. S. Patent No. 2,626,147.

2. Your belief that Universal's pusher plate is not supported or operated in the manner defined by Claim 1.

I do not attach the same importance as you do to the Gjostein patent, at least for the reasons that Gjostein does not disclose or suggest equipment in which a stack is fed from below, and the elements operated by cylinders 17 are not take-off devices.

Plaintiffs' Exhibit 25 - Letter Dated March 30, 1970 from Ostrolenk Faber Gerb & Soffen to Arthur B. Colvin. Esq. E82

OSTROLENK, FABER, GERB & SOFFEN

As for the reading and scope of Claim 1 in the S&S patent, I find that neither the specification nor the prior art requires the very narrow interpretation you advocate. A fair reading of Claim 1 encompasses Universal's underfed stacker-straightener.

In view of the foregoing, you are urged to reconsider the positions you have taken up to now, and hopefully you will then advise Universal that it should not continue marketing its present underfed stacker-straightener or colorable imitations thereof.

Very truly yours,

OSTROLENK FABER GERB & SOFFEN

Jerome M. Berliner

Jerome M. Berliner

JMB - jab

cc - Mr. Mitchel Flaum

PLAINTIFFS' EXHIBIT 26 - LETTER DATED JUNE 17, 1970 FROM OSTROLENK FABER GERB & SOFFEN TO GEORGE KARR

OSTROLENK, FABER, GERB & SOFFEN
ATTORNEYS AT LAW
[illegible] EAST 40TH STREET
NEW YORK, N.Y. 10016

[illegible]
[illegible]
MARVIN C. SOFFEN
SAMUEL H. WEINER
JEROME M. BERLINER
LOUIS WEINSTEIN
[illegible]
ROBERT C. FABER
CHARLES I. BROOKS

PATENTS
TRADE MARKS
RELATED CAUSES

TELEPHONE
(212) 682-0470

CABLE
OSTROFABER NEW YORK

PLAINTIFF'S EXHIBIT No. 26 20C726

Certified Mail - R.R.R.
June 17, 1970

Mr. George Karr
Western Kraft Corporation
1601 Standard Plaza
Portland, Oregon

Re: S8.1-008 - U. S. Patent No. 2,988,236 for "Blank Stacking, Straightening and Delivery Device"

Dear Mr. Karr:

We represent the S&S Corrugated Paper Machinery Co. Inc. of Brooklyn, New York, the owner of United States Patent No. 2,988,236, issued June 13, 1961 to Albert F. Shields for a "Blank Stacking, Straightening and Delivery Device".

It has recently come to the attention of our client that a machine operating in your plant at San Leandro, California comes within the purview of the claims of our client's aforesaid U. S. Patent No. 2,988,236. The machine referred to is an [illegible] stacking, straightening and delivery device, manufactured by the Universal Corrugated Box Machinery Corporation of Cranford, New Jersey.

Your use of this Universal machine is deemed to be an infringement of our client's patent rights.

Accordingly, demand is made that you immediately cease and desist the infringing acts complained of, and within ten days of receipt of this letter advise us of the steps you have taken to comply with this demand.

Very truly yours,

OSTROLENK FABER GERB & SOFFEN

Jerome M. Berliner

JMB - jab
cc - S&S Corrugated Paper Machinery Co., Inc.

PLAINTIFFS' EXHIBIT 27 - LETTER DATED NOVEMBER 19, 1971 FROM OSTROLENK FABER GERB & SOFFEN TO DOUGLAS W. WYATT, ESQ. E84

OSTROLENK, FABER, GERB & SOFFEN
ATTORNEYS AT LAW
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NEW YORK, N.Y. 10016

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1898-1968

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MARVIN C. SOFFEN
SAMUEL H. WEINER
JEROME M. BERLINER
LOUIS WEINSTEIN
MARC S. GROSS
ROBERT C. FABER

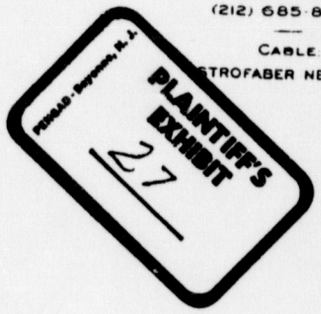
EDWARD A. MEILMAN
HOWARD SCHULDENFREI

PATENTS
TRADE MARKS
RELATED CAUSES

TELEPHONE
(212) 685-8470

CABLE
STROFABER NEW YORK

November 19, 1971



Douglas W. Wyatt, Esq.
Wyatt, Gerber & Shoup
230 Park Avenue
New York, New York 10017

Dear Mr. Wyatt:

Re: S7.0-001 - Koppers et al v S&S
EDNY 70 Civ. 926

Dear Mr. Wyatt:

During my discussion with Mr. Shields concerning the recent pre-trial conference and the making of arrangements for Judge Costantino to examine machines of the type involved in this litigation, Mr. Shields expressed the belief that the S&S stacker-straightener at Hankins Container Co. in Union, New Jersey does not have a reciprocating slapper plate for straightening the boxes. It is Mr. Shields's belief that this Hankins machine straightens the boxes by using lifting belts for engaging the leading and trailing edges of the stack. If this is the case, then the S&S machine at Hankins does not come within the purview of the patent in suit.

It is believed that arrangements can be made for Judge Costantino to view a relevant S&S stacker-straightener at a box plant in Brooklyn or at a Queens location close to Brooklyn.

I look forward to receiving Plaintiffs' answers to Defendant's Second Set Of Interrogatories.

Very truly yours,

OSTROLENK FABER GERB & SOFFEN

Jerome M. Berliner

JMB:jab

PLAINTIFF'S EXHIBIT 28

Nov. 13, 1962 A. F. SHIELDS 3,063,577

COUNTING MEANS

Filed May 12, 1959

2 Sheets-Sheet 1

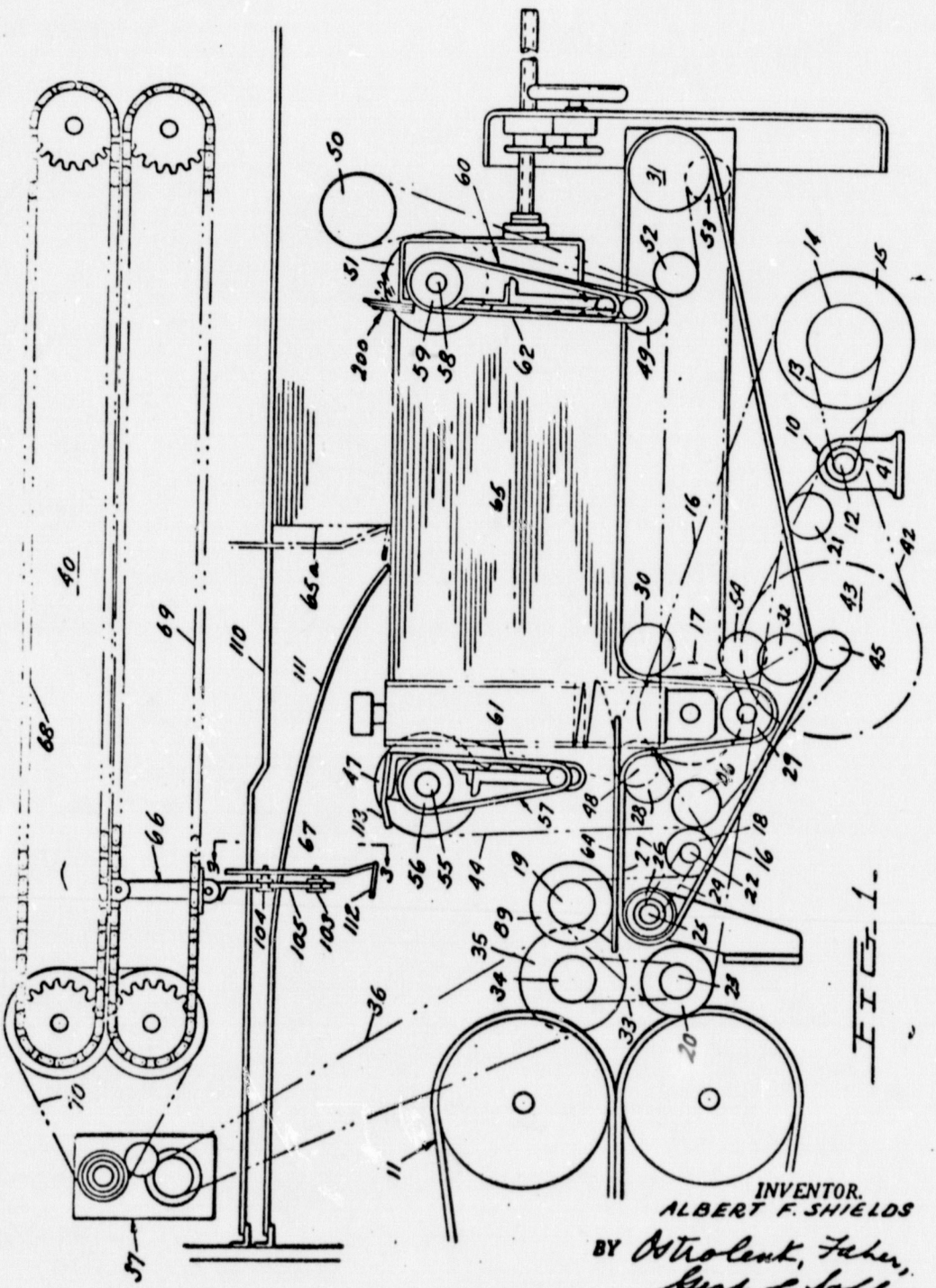


FIG. 1.

INVENTOR.
ALBERT F. SHIELDS
BY Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

Nov. 13, 1962 A. F. SHIELDS 3,063,577

COUNTING MEANS

Filed May 12, 1959 2 Sheets-Sheet 2

FIG. 2.

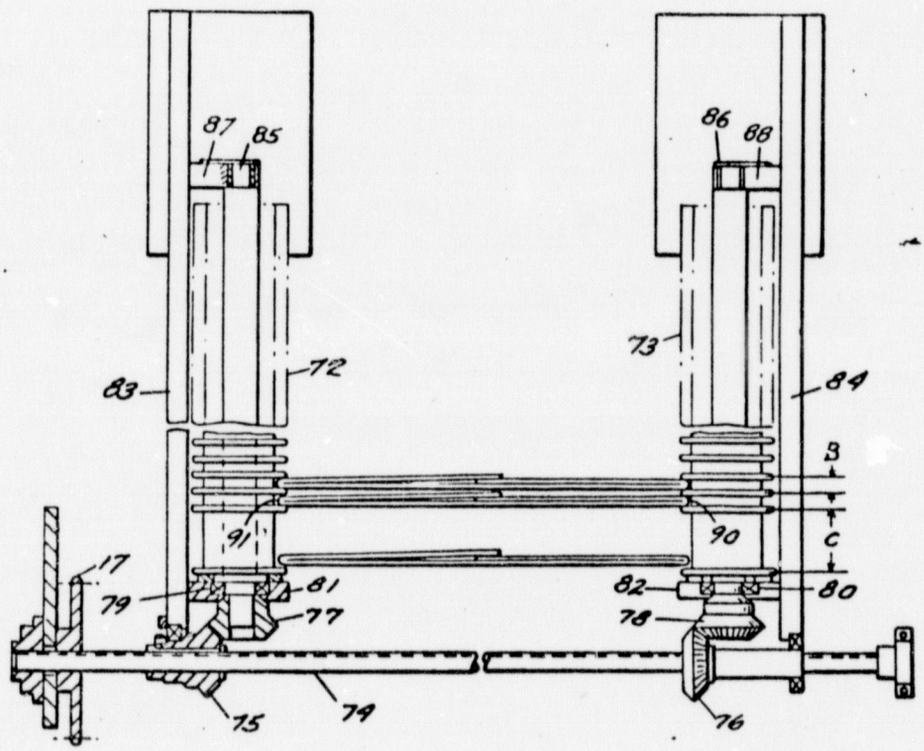
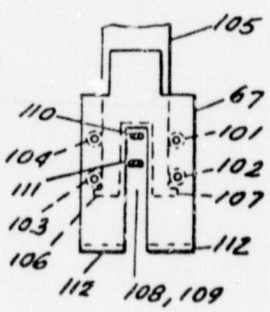


FIG. 3.



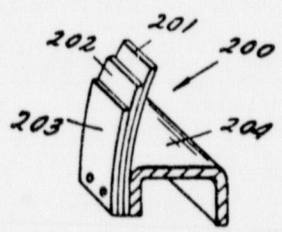


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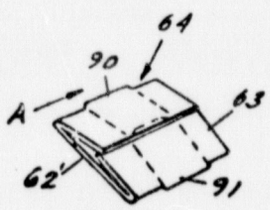


FIG. 5.

INVENTOR.
ALBERT F. SHIELDS
BY Astrolent, Faber, Merle & Soffen
ATTORNEYS

United States Patent Office 3,063,577 Patented Nov. 13, 1962

3,063,577

COUNTING MEANS

Albert F. Shields, Forest Hills, N.Y., assignor to S & S Corrugated Paper Machinery Company, Inc., Brooklyn, N.Y.

Filed May 12, 1959, Ser. No. 812,703
12 Claims. (Cl. 214—6)

The instant invention is an improvement of the stacking, straightening and delivery device described in my copending application Serial No. 775,199, filed November 20, 1958, now Patent No. 2,931,520, and assigned to the assignee of the instant invention. More particularly, this invention is directed to novel means for delivering stacks having equal numbers of folded tubular boxes from the device of my aforesaid copending application.

In the device of my aforesaid copending application two sets of horizontally spaced continuously moving belts are utilized as the stacking and straightening means for box blanks which have been operated upon by a high speed folding and gluing machine. As the folded and glued boxes leave the folding machine they are traveling at high speed in a horizontal path. The moving belts are positioned with upwardly moving flights disposed to intercept the boxes as they move in this horizontal path thereby arresting their horizontal movement and imparting an upward vertical movement thereto. Thus, the leading and trailing edges of the folded, glued blanks are engaged by the upwardly moving belt flights so that the blanks remain in a horizontal position and form a stack which is fed from below.

A delivery device, coordinated with the operation of both the folding machine and stacking device, is included to periodically remove a pile of blanks from the top of the stack and deliver the pile to a horizontal conveyor. It has been found that in large runs, say of 10,000 boxes, the delivery device will have delivered the desired total number within the limits of plus or minus one blank. While this is an extremely small overall error, it has been found that the individual piles, say of 20 blanks each, which go to make up the total of 10,000 blanks may also be off by plus or minus one blank. The one blank error in 20 can be extremely annoying and must be eliminated.

The counting error at the delivery device is attributable to the fact that the folded blanks leaving the folding machine are not all in the same condition. That is, some blanks require more straightening than other blanks. Because of this the engagement of the leading and trailing edges of each blank by the upwardly moving belt flights does not occur at the same time so that the blanks in the straightening device stack are not uniformly spaced. Since the delivery device merely removes say the top 12 inch portion of the stack rather than a predetermined number of blanks, the pile removed from the stack does not necessarily contain the desired number of blanks.

The device of the instant invention overcomes the undesirable characteristic which has previously been noted by including novel means for maintaining a predetermined spacing between the blanks of the stack. This is accomplished by providing a set of screws which are arranged in a manner such that the longitudinally extending edges of the folded tubular boxes are engaged by the screw threads as the blanks emerge from the folding machine into the straightening device. The screws are single threaded and are rotated at a speed whereby they make a single revolution for each blank delivered by the folding machine. The screws are vertically arranged so that they move one box upwardly one pitch per revolution. This upward movement of the

boxes is independent of whether or not the leading and trailing edges thereof are engaged by the upwardly moving belt flights.

At the top of the set of screws which corresponds with the top of the straightening section, the straightened boxes are pushed off by the delivery device as in my aforesaid copending application. However, now since there is a precise number of boxes rising in the straightening section there will also be an exact number of boxes in the pile that is being delivered from the top of the stack.

The screw threads are of uniform pitch from the tops thereof downward for substantially the entire lengths thereof. However, the thread pitch in the area which initially engages the folded tubular boxes is considerably greater than the pitch of the remaining screw length. The wide pitch provides a wide entrance for the folded boxes entering the straightening device. Thus, any slight variation or lack of coordination between the folding and straightening device will not interfere with the operation of the device.

The addition of the vertically extending screws provides an additional advantage of which accrues from lifting each blank as it arrives in the straightening device prior to the arrival of the next succeeding blank. That is, in the device of my aforesaid copending application the initial lift of the blank is supplied by the next succeeding blank forcing its way to the bottom of the stack. Thus, the bottom blank rubs against the blank thereabove and in so doing very often causes the smearing of ink, forming printed matter, which has not fully dried. Smearing of undried ink will not occur in the device of the instant invention since no rubbing takes place between blanks as the blocks enter the stacking section.

Accordingly, a primary object of the instant invention is to provide novel means for assuring that the piles delivered from a box straightening device will each contain a predetermined number of boxes.

Another object is to provide novel means for raising the blanks of a blank stacking and straightening device.

These as well as other objects of the instant invention shall become readily apparent after reading the following description of the accompanying drawings in which:

FIGURE 1 is a side elevation in schematic form of a stacking, straightening and delivery device which includes applicant's novel screw means for assuring uniformity in the number of blanks which comprise the piles delivered by the device.

FIGURE 2 is a fragmentary view of the device of FIGURE 1 illustrating the manner in which motion is imparted to the lifting screws.

FIGURE 3 is a rear view of the pusher plate.

FIGURE 4 is a perspective view of the flexible front guide means.

FIGURE 5 is a perspective view of a blank folded to form a collapsed tubular box.

Now referring to the figures, driving power is supplied to the mechanism illustrated in FIGURE 1 by variable speed electric motor 10 which may also drive the preceding mechanism such as folding and gluing machine 11. Drive sprocket 12 keyed to the output shaft of motor 10 acts through chain 13 to drive sprocket 14. Sprockets 14 and 15 are keyed to the same shaft (not shown) so as to rotate in unison. Rotation of sprocket 15 causes movement of chain 16 which passes over sprocket 17, beneath sprocket 18, over sprocket 19, to the left and below sprocket 20, and above sprocket 21.

Sprockets 18 and 22 are keyed to a common shaft (not shown). Chain 24 driven by sprocket 22 drives sprocket 25, keyed to the same shaft as drive sprocket 26 which drives conveyor belt 27. Belt 27 is generally horizontal in the region between drive sprocket 26 and idler sprocket

28. After passing over sprocket 28 conveyor belt 27 takes a pronounced dip by passing beneath idler 29 and thence upwardly around idler 30. Conveyor 27 is generally horizontal in the region between idlers 30 and 31 and is slightly raised above the horizontal portion of belt 27 between sprocket 26 and idler 28. After passing to the right (with respect to FIGURE 1) of idler 31, belt 27 passes beneath idlers 31 and 32 thereafter moving upwardly and to the left about drive sprocket 26.

Sprocket 23, keyed to the same shaft (not shown) as sprocket 20, drives chain 33 which in turn drives sprocket 34. Sprocket 35, keyed to the same shaft (not shown) as sprocket 20, drives chain 33 which in turn drives sprocket 34. Sprocket 35, keyed to the same shaft (not shown) as sprocket 34, drives chain 36 which supplies driving power to variable speed drive unit 37. Unit 37 in turn supplies the driving power to the delivery mechanism 40 as fully explained in my copending application 645,801.

Sprocket 41 keyed to the output shaft of motor 10 drives chain 42 which in turn drives fly wheel 43. Chain 44 is driven by sprocket 45 which is keyed to a common shaft (not shown) with fly wheel 43. Chain 44 passes upwardly to the left from drive sprocket 45 around to the left of sprocket 46, upwardly and around the top of sprocket 47 then downwardly beneath sprocket 48. Between idler sprockets 48 and 49 chain 44 is generally horizontal. Chain 44 then passes upwardly and to the right of idler 49 and another sprocket 50. In passing between sprockets 49 and 50 chain 44 is in operative engagement with sprocket 51 so as to cause rotation thereof. Chain 44 passes downwardly from the right side of sprocket 50 to the left and beneath sprocket 52 thence to the right around sprocket 53. Chain 44 is generally horizontal in the region between sprockets 53 and 54 and after passing above and to the left of sprocket 54 chain 44 passes to the right and beneath drive sprocket 45.

The rotation of sprocket 47 causes rotation of shaft 55 having sprocket 56 keyed thereto. Sprocket 56 imparts motion to rear belt means 57 as fully explained in my copending application Serial No. 775,199, filed November 20, 1958, and entitled "Accumulating and Straightening Device." Similarly, sprocket 51 is mounted to shaft 58 having sprocket 59 keyed thereto with sprocket 59 imparting motion to the forward belt means 60.

Belt means 57 and 60 include upwardly moving flights 61, 62, respectively, which engage the trailing 62' and leading 63 edges of folded tubular box 64 as folded and glued box blank 64 moves through the mechanism from left to right with respect to FIGURE 1, or in the direction indicated by arrow A of FIGURE 5. The region between belt means 57 and 60 is designated as the stacking region since the folded tubular boxes 64 after moving horizontally on conveyor 27 have the horizontal movement thereof arrested and changed to a vertical movement whereby stack 65 is formed. Straightening of boxes 64 occurs in the stacking region since flights 61, 62 converge slightly as from bottom to top as fully explained in my aforesaid copending application 775,199.

Periodically, pusher device 66, which includes pusher plate 67, as it moves from left to right (with respect to FIGURE 1) in a lowered position engages the top portion of stack 65 so as to remove a pile of blanks 65*a* therefrom. Chains 68 and 69, driven by variable speed drive 37 through chain 70, impart oscillatory motion to pusher means 66 whereby pusher 66 moves from left to right in a lowered position and from right to left in a raised position as fully explained in my aforesaid copending application 645,801.

In order to insure that the number of folded tubular boxes 64 comprising pile 65*a* will be of a predetermined number, the mechanism includes screws 72, 73 which are continuously driven by means of sprocket 17. Sprocket 17 is keyed to transverse shaft 74 having bevelled gears 75, 76 keyed thereto driving bevelled gears 77, 78, respectively, which are keyed to screws 72, 73, respectively, at the lower ends thereof. Thus, the rotation of transverse shaft 74 causes screws 72, 73 to rotate in unison. The lower ends of screws 72, 73 are journalled by bearings 79, 80, respectively, which are mounted within brackets 81, 82, respectively, extending inwardly from transversely adjustable frame members 83, 84, respectively. The upper ends of screws 72, 73 are journalled in bearings 85, 86 carried by brackets 87, 88, respectively, extending inwardly from frame members 83, 84, respectively.

As is apparent from FIGURE 2 the threads which occupy a majority of the length of each of the screws 72, 73 are of a uniform pitch B. However, at their lower ends the threads of screws 72, 73 are opened out to a pitch C which is considerably larger than pitch B.

As a blank 64 is fed from mechanism 11 to the right, blank 64 is engaged by upper pressure roller 89 which is keyed to a common shaft with sprocket 19. The cooperation of roller 89 and conveyor belt 27 moves blank 64 to the right through the space formed between the lower end of rear belt means 57 and conveyor 27 with the side edges 90, 91 of blank 64 thereafter entering the spaces between the threads of wide pitch C. Screws 72 and 73 are rotating in such a direction that the threads thereof will impart a lifting action to blanks 64 as they enter the stacking region even before the leading and trailing edges 63, 62 are engaged by upwardly moving belt flights 62, 61.

Typically, each of the screws 72, 73 are of five inch diameter with thread pitch B being equal to ⅝ of an inch and the opened thread pitch C being equal to 2¾ inches so as to be capable of accepting severely warped blanks 64. Flights 61, 62 of belt means 57, 60, respectively, are then operated to rise at a rate of ⅝ of an inch for each blank 64 received from machine 11. Screws 72, 73 rotate through one revolution for each blank 64 received from machine 11. In this manner screws 72, 73 cooperate to raise the blanks 64 at the same rate as they are being raised through the cooperation of flights 61, 62.

As blanks 64 move upwardly in stack 65 they are substantially equally spaced apart by the thread pitch distance B. Because of this a predetermined number of blanks will move post the top of lift screws 72, 73 in a given time so that pusher means 66 will always remove a pile 65*a* containing a predetermined number of blanks 64. The expression "past the top of lift screws" refers to the region above the top of the screw threads.

Pusher plate 67 has pivotally mounted thereto peripherally grooved wheels 101–104. The grooves of wheels 101–104 receive the longitudinal edges of support plate 105 and because of this pusher plate 67 may be moved vertically relative to support plate 105. Ears 106, 107 extending outwardly from support plate 105 at the bottom thereof limit the downward movement of pusher plate 67. Aligned grooves 108, 109 in support plate 105 and pusher plate 67, respectively, provide a clearance opening for flexible hold-down strips 110, 111 which apply a downward pressure to stack 65 even while pile 65*a* is being removed from the top thereof.

Rearward extensions 112, at the bottom of pusher plate 67, are adapted to ride upon fixedly mounted guide members 113 which are positioned rearwardly of belt flight 61 in line with the tops of the threaded portions of screws 72, 73. The cooperation of members 112, 113 further assures that the initial engagement between pusher plate 67 and stack 65 occurs at a time when the top portion 65*a* thereof, which is to be removed, is comprised of a predetermined number of blanks 64.

As explained in my aforesaid copending application Serial No. 645,801, now Patent No. 2,963,177, flexible front guide means 200, comprising flexible strips 201–203 secured to frame member 204, is positioned at the leading edge of the stack at approximately the level of the top of lift screws 72, 73. Front guide means 200 acts to effectively hold back the portion of stack 65 not being removed by pusher plate 67.

Thus, I have provided novel means, including rotatable lift screws, for raising blanks in a stacking, straightening device in a manner such that each pile 65*a* delivered from the device will be comprised of a precise number of blanks.

Although the present invention has been described in connection with exemplary embodiments thereof, variations and modifications thereof within the broader spirit and scope of the invention will now be apparent to those skilled in the art, and it is not intended to be limited except as set forth in the following claims.

I claim:

1. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means continuously operated in a single direction and disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to each individual one of said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means.

2. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means continuously operated in a single direction and disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to each individual one of said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads.

3. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below.

4. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below; said set of screws being operatively positioned to engage said blanks at the side edges thereof.

5. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below; said set of screws being operatively positioned to engage said blanks at the side edges thereof; said set of screws being rotated through one revolution for each blank issuing from said machine.

6. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above

said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below; the upward movement of said belt, the rotational speed of said set of screws, and the first thread pitch being proportioned in a manner such that said upwardly moving flights move said blanks upward at the same rate as the portions of said set of screws having the first thread pitch.

7. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below; a pusher plate positioned above said first and said second belt means and periodically engageable with a top portion of said stack for removal thereof.

8. A stacking straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below; a pusher plate positioned above said first and said second belt means and periodically engageable with a top portion of said stack for removal thereof; said top portion of said stack comprising blanks which have risen above the top of said set of screws.

9. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region, said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below; a pusher plate positioned above said first and said second belt means and periodically engageable with a top portion of said stack for removal thereof; a fixedly mounted member positioned adjacent to the top of said second belt means; said pusher plate including a rearwardly extending portion movable into engagement with said fixedly mounted member for guidance thereby during the initial engagement between said pusher plate and said top portion of said stack.

10. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks; said mechanism comprising a horizontal conveyor operable in synchronism with said machine to receive blanks issuing therefrom in a flat position; an intercepting and accumulating device operatively positioned above said conveyor to form said blanks into a stack which is fed from the bottom thereof; said accumulating device including a first and a second belt means each having upwardly moving flights operatively positioned at a stacking region to engage the leading and trailing edges, respectively, of said blanks thereby imparting upward movement to said blanks; and means disposed at said stacking region operatively positioned to engage said blanks as they enter said stacking region; said last recited means being constructed to impart upward movement to said blanks prior to and during the upward movement attributable to the cooperation of said first and said second belt means; said last recited means comprising a set of vertically extending rotatable screws positioned to receive said blanks in the spaces between screw threads; each screw of said set of screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread

pitch being in the portion of the screw length which initially contacts said blanks as they enter said stack from below; a pusher plate positioned above said first and said second belt means and periodically engageable with a top portion of said stack for removal thereof; driving means synchronizing the operation of and imparting continuous movement to said first belt means, said second belt means, said set of screws, and said pusher plate.

11. In combination a first means, and a second means for conveying articles in single file in a generally horizontal delivery path to said first means; said first means comprising a first screw disposed on one side of the center of said delivery path and a second screw disposed on the other side of the center of said delivery path; means connected between said first and said second means for rotating said screws and operating said second means in a coordinated manner; said screws being vertically extending and operatively positioned to receive side edges of articles, delivered by said second means, in the spaces between screw threads; said screws after receiving an article imparting an upward movement thereto forming said articles into an underfed stack; each of said screws having a uniform first thread pitch for a majority of the length thereof; each of said screws having a second thread pitch substantially greater than said first thread pitch; said second thread pitch being in the position of the screw length which initially contacts articles fed by said second means; and a delivery device connected to said first and said second means for coordinated operation therewith; said delivery device periodically passing over said first means from rear to front and thereby engaging and removing from the top of said stack a portion thereof which has cleared the tops of said screws, guide means positioned at the tops of said screws to the rear of said stack; said guide means being engaged by said delivery device to form a support therefor at the time when said feed delivery device initially engages said portion of said stack.

12. The combination of claim 11 in which the delivery device is in continuous operation moving from rear to front in a first path which is lower than a second path in which said delivery device moves from front to rear.

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A. F. SHIELDS

3,409,148

STACKING DEVICE

Filed Dec. 27, 1965

4 Sheets-Sheet 1

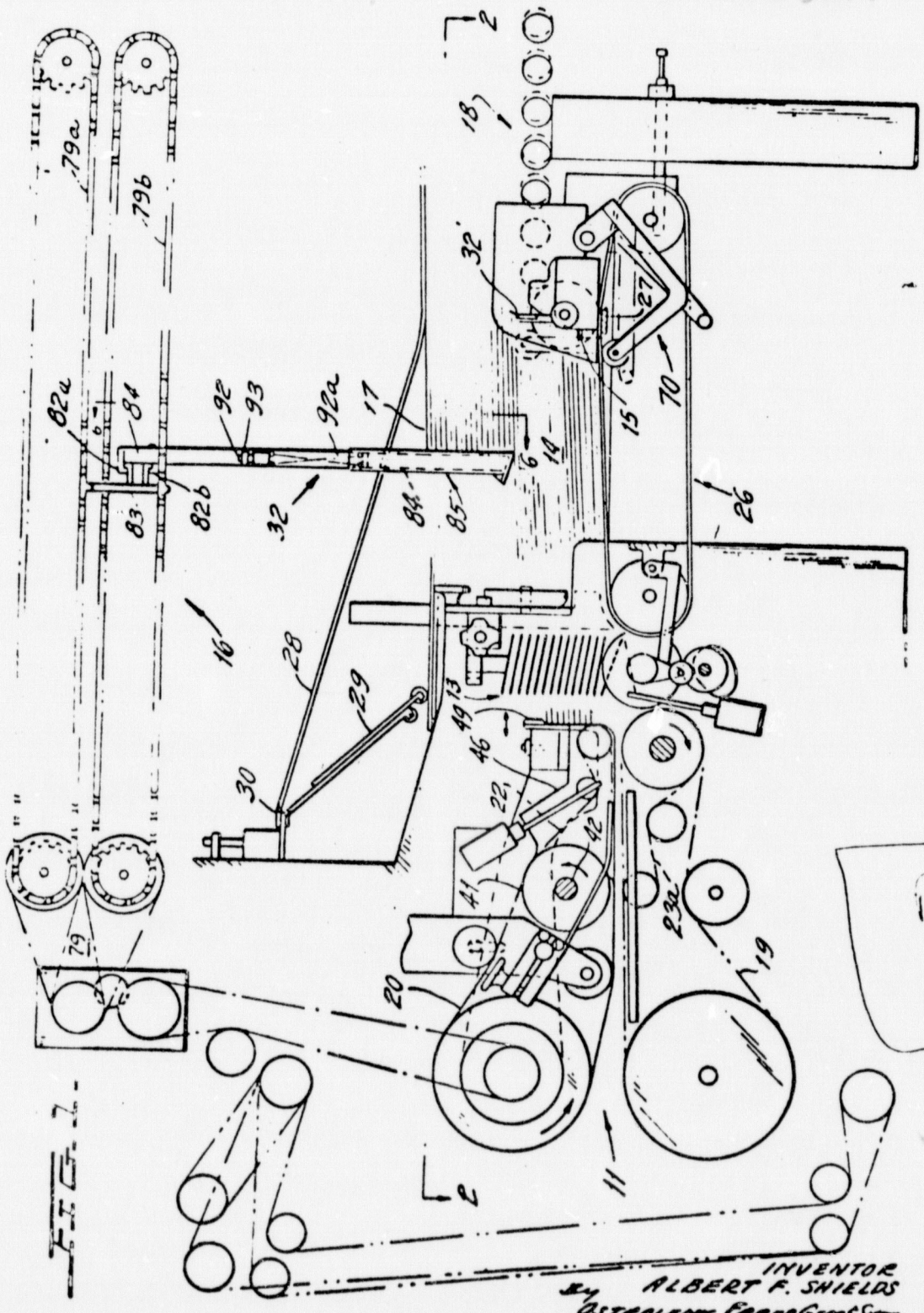


FIG. 1.

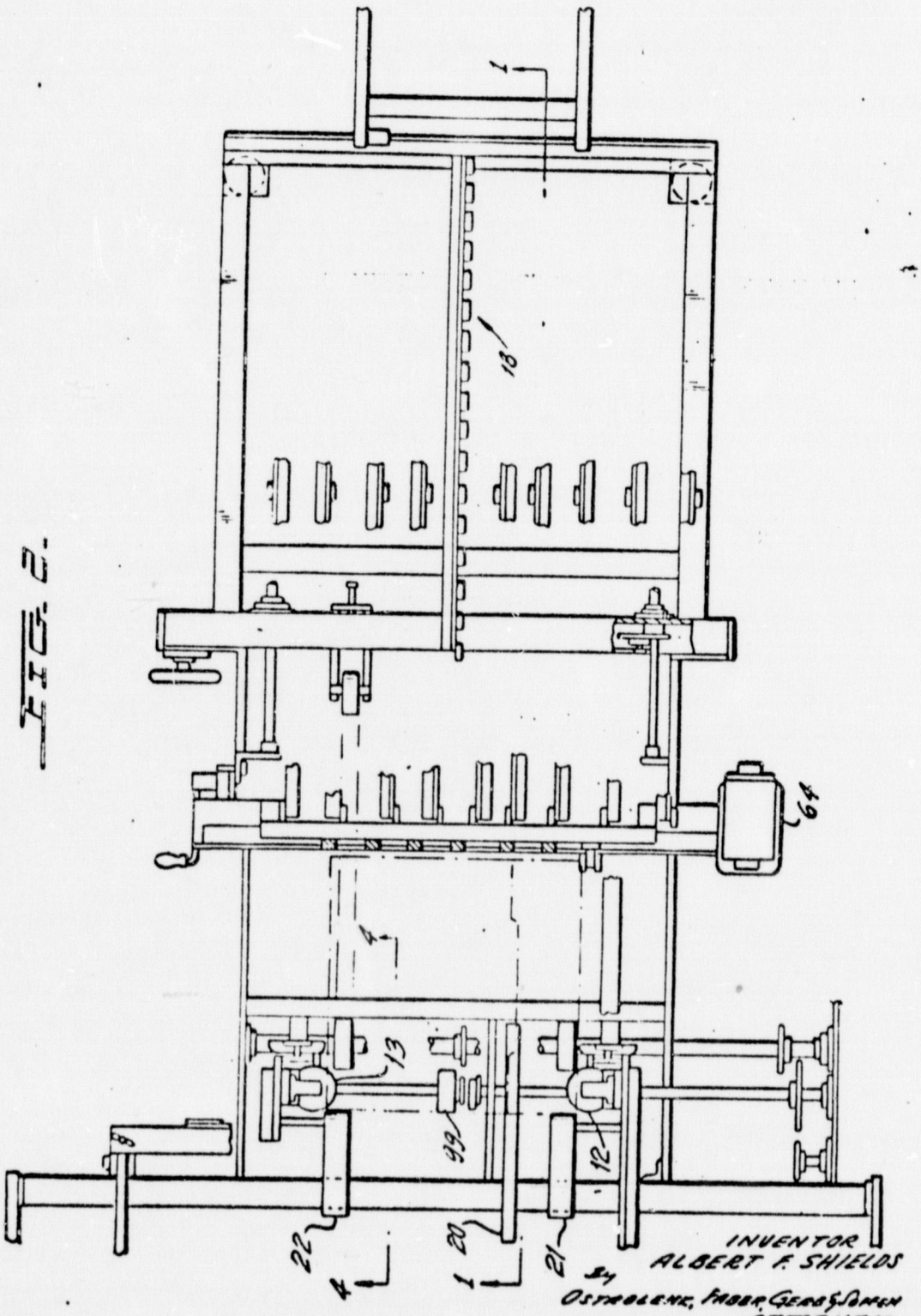
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FIG. 2.



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FIG. 4.

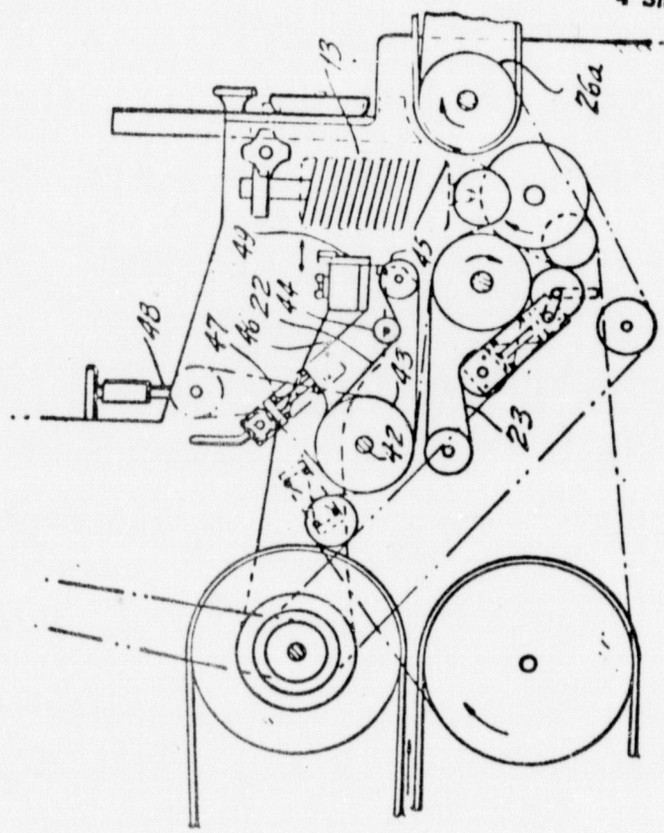
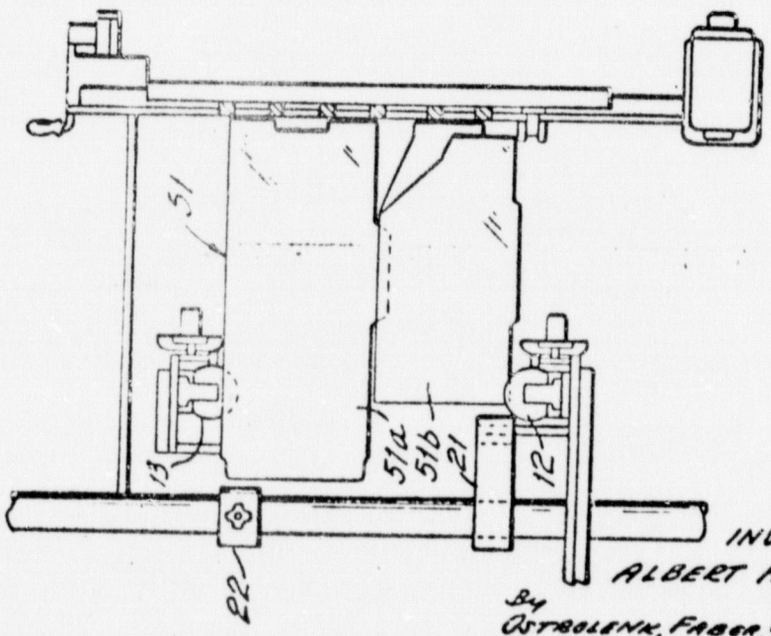


FIG. 3.



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FIG. 6A.

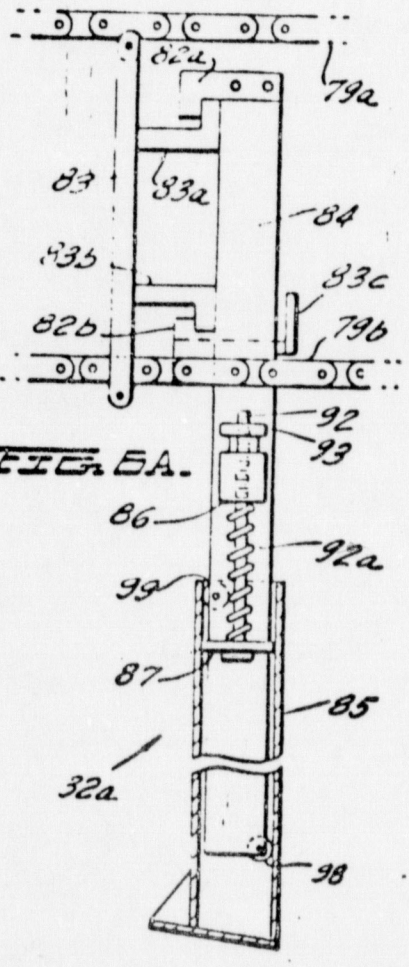


FIG. 6.

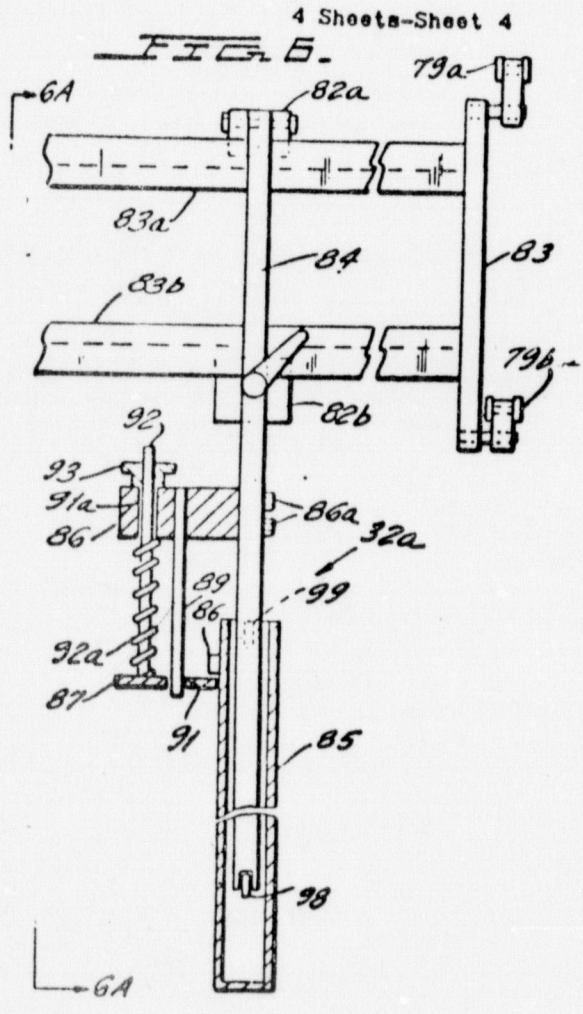
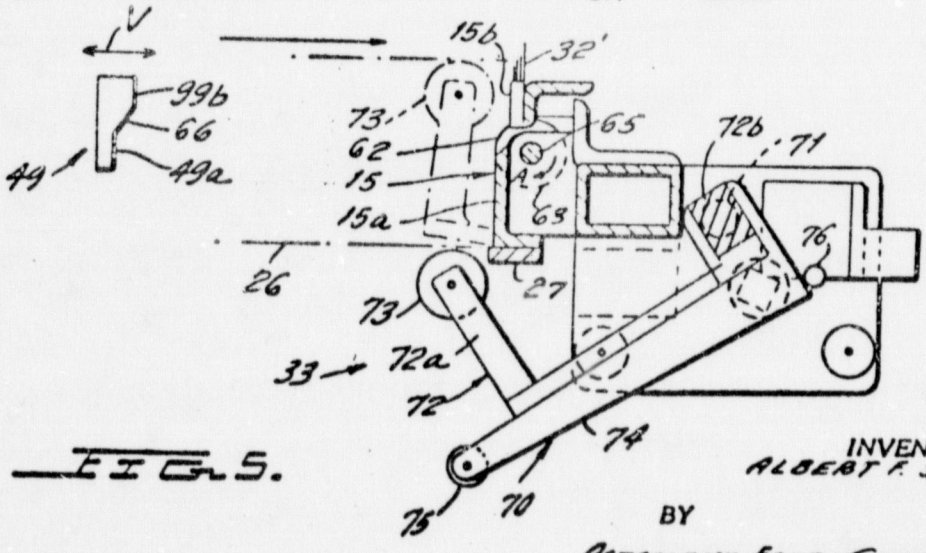


FIG. 5.



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United States Patent Office 3,409,148 Patented Nov. 5, 1968

3,409,148

STACKING DEVICE

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Filed Dec. 27, 1965, Ser. No. 516,421
13 Claims. (Cl. 214—6)

ABSTRACT OF THE DISCLOSURE

Box folding, stacking and straightening apparatus is provided with independently adjustable upper conveyor belts to positively control feeding of folded boxes to a point along the feed path as close to the stacking section as practical without interfering with entry of folded boxes to the bottom of a rising stack. Upper conveyor belts are selectively pivoted between two discrete positions in one of which the upper belt remains in engagement with the folded box until a point very close to the stacking section to retain positive control of relatively short boxes. In the other position the upper belt releases engagement with the folded box at a point considerably to the rear of the stacking section so that the lifting of relatively long boxes in the stacking section will not be impeded by the horizontal conveyor means. Boxes of irregular shape at the leading edge are handled without skewing by placing different sections of the upper belt in different positions. The barrier in the stacking section to arrest forward movement of the blanks is stepped in a forward direction and is provided with a transition region including a roller rotating on a horizontal axis so as to lift the leading edges of the folded boxes and in this way minimize the weight applied to folded boxes as they enter the stacking section. Periodically, a delivery device engages the upper end of the stack to remove a pile of boxes therefrom. Such delivery device is provided with independently adjustable stop means for a plurality of vertically movable pusher arms so that the irregular shape of the folded box at the top of the stack will not prevent the delivery of a pile having a predetermined number of folded boxes therein. At the end of a run, the last few folded boxes are raised to a position at the top of the barrier by a manually operated lift means to clear the top of the barrier means and be removed by the pusher arms.

The instant invention relates to paper box making machinery in general and in particular relates to an improved construction of the type of apparatus disclosed in my United States Patent 3,203,561 issued Aug. 31, 1965, and entitled, Lift Cam for Stacking Device.

Broadly speaking, devices of the type under consideration include feed belts which receive blanks issuing from a folding machine as folded tubular boxes and convey these blanks along a generally horizontal feed path to a point where the side edges of the blanks are engaged by lifting screws and the forward movement of the blanks is arrested by engagement of the leading edges with a vertically extending barrier positioned forward of the lifting screws. The lifting screws raise the blanks above the feed path to form a bottom fed stack and a pusher means, operated in time relationship with the lifting screws, moves horizontally from the rear into engagement with the top portion of the stack to remove a pile containing a predetermined number of blanks.

As hereinafter described in detail, the instant invention provides improved horizontal conveyor means which include upper belt sections that are selectively adjustable so that these belt sections will not cause interference with blanks after they have been engaged by the lifting screws. More particularly, in the case of relatively short blanks,

it is necessary to provide driving power by the conveyor belts to a point very close to the lifting screws. However, if driving power to this same point is maintained when relatively long blanks are being handled, the rear of these long blanks will be held down by the conveyor means while the lifting screws are raising the front portion of these long blanks. If these blanks are extremely long, the lifting belts will raise the blank a considerable distance prior to release of the blank by the conveyor belt and under these circumstances the blanks will be damaged.

In order to alleviate this condition the upper conveyor belt means of the instant invention is selectively positionable so that it positively drives short blanks to a point very close to the lifting belts. When relatively long blanks are being handled the upper feed belt means is repositioned so that it ceases to positively drive the relatively long blank prior to the time that this blank is lifted to any great extent by the lifting screws.

This upper belt means is hereinafter shown as comprising two independently adjustable sections so as to facilitate the handling of die cut boxes in which one portion of the trailing edge extends considerably to the rear of another portion of the trailing edge. Under the latter circumstances the more rearwardly extending trailing edge portion is released by the upper conveyor belt means at a point considerably to the rear of the point at which the less rearwardly extending trailing edge portion of the blank is released by the upper conveyor belt means. This assures a positive conveyor movement of the blank without cocking until such time as the blank is well under the control of the lifting screws.

As previously noted, in the device under consideration an underfed stack is formed by lifting screws positioned at the sides of the stack near the rear thereof. The threads of the lifting screws separate and positively support the blanks at the rear of the stack but at the forward end of the stack the lower blanks support the upper blanks. Under certain operating conditions, principally when the stack is permitted to become relatively high prior to removal of the top portion, the stack becomes relatively heavy and, unless appropriate measures are taken, a considerable downward force acts upon the lower blanks in the stack and may interfere with the entry of new blanks at the bottom of the stack. In order to overcome this condition the instant invention provides a vertical barrier means having a forwardly stepped portion at the upper end thereof with the upper and lower portions of the barrier means being connected by a transition means so constructed that the bottom blanks in the stack are not required to support the weight of the blanks positioned at the forwardly stepped upper end of the barrier means.

In the form of the instant invention to be hereinafter described the transition region is formed by a peripheral portion of a wheel means which is positioned and rotated so that the peripheral portion moves upwardly and forward. Once the leading edge of a blank is engaged by the wheel means this blank is lifted away from the blanks below the transition region so that the weight thereof no longer acts on the blanks entering the stack from below.

In order to assure that each of the piles removed from the top of the stack contains the same number of blanks it is essential that engagement between the pusher means and the top of the stack be accurately controlled. It has been found that with a single pusher means member engaging the top of the stack, quite often the desired results are not achieved. In the case of boxes having glue joints, it is believed that the last mentioned undesirable effect results from the fact that a glue joint, even though crushed, presents a thickness greater than the thickness of a single sheet of uncrushed board, with this additional thickness being a variable quantity within a given run.

It has been found that superior results are obtained by constructing a pusher comprised of side-by-side members which are independently adjustable to their lowermost, or stack engaging, positions. As will hereinafter be shown, the adjusting means is so constructed and positioned that it may be operated while the pusher means is in operation thereby facilitating the making of adjustments required to compensate for unpredictable variations.

Accordingly, a primary object of the instant invention is to provide a novel construction for the stacking section of box making apparatus.

Another object is to provide apparatus of this type having novel horizontal conveyor means.

Still another object is to provide apparatus of this type having novel means for limiting forward movement of the blanks.

A further object is to provide apparatus of this type having novel means for lifting the stack to delivery position at a time after the last blank is fed into the stacking device.

A still further object is to provide apparatus of this type with novel pusher means to increase accuracy of the count in piles of blanks being delivered.

These as well as other objects of this invention will become readily apparent after reading the following description of the accompanying drawings in which:

FIGURE 1 is a longitudinal cross-section taken through line 1—1 of FIGURE 2 looking in the direction of arrows 1—1 and illustrating apparatus constructed in accordance with the teachings of the instant invention.

FIGURE 2 is a fragmentary plan view taken through line 2—2 of FIGURE 1.

FIGURE 3 is an enlarged fragmentary plan view showing a die cut blank at a time when its forward motion has been arrested in the stacking region.

FIGURE 4 is a fragmentary cross-section taken through line 4—4 of FIGURE 2 looking in direction of arrows 4—4.

FIGURE 5 is an enlarged fragmentary side elevation illustrating the relationship between selected elements at the front barrier.

FIGURE 6 is a front elevation looking in the direction of arrows 6—6 of FIGURE 1 and showing one section of the pusher means for removing piles of blanks from the stacking section.

FIGURE 6A is a side elevation of the pusher means looking in the direction of arrows 6A—6A of FIGURE 6.

Now referring to the figures and more particularly to FIGURE 1. The portions of the box making apparatus incorporating the novel features of the instant invention include conveyor means 11 which receives box blanks in folded tubular form from a folding machine (not shown) positioned to the left of FIGURE 1. Conveyor means 11 moves the blanks forward along a generally horizontal feed path and delivers these blanks to lift cam operated roller 99 and lift screws 12, 13. The threads of screw means 12, 13 engage the edges of the blanks to impart upward movement to such blanks to form stack 14 which is fed from below. Forward movement of the blanks is arrested by barrier means 15, shown enlarged in FIGURE 5. Delivery means 16, positioned above stack 14, periodically engages the upper portion of stack 14 to remove a pile 17 of blanks from the top of stack 14 and deliver pile 17 in a forward direction on to the rollers of conveyor table 18.

Conveyor means 11 is, in essence, 3 pairs of continuous belt devices driven at the same speed with lower belt device and 2 belts 23 and 23*a*, sections 19, 23, 23*a* positioned below the feed path for entering blanks and upper belt device sections 20, 21, 22 positioned above the feed path. The lower flight of belt 20 and the upper flight of belt 19 always confront one another and with belts 21, 22 in the positions shown in FIGURE 4, the lower flights thereof also confront the upper flights of belts 23 and 23*a*, respectively. Belts 21 and 23 are mating belts which are located on one side of the machine while belts 22 and 23*a* are mating belts which perform the same function as belts 21, 23 on the other side of conveyor means 11.

Since details of the chains and sprockets connecting the power source to the elements of the apparatus for operation in timed coordination form no part of the instant invention and are within the knowledge of those skilled in the art, descriptions thereof are not contained herein.

Conveyor belt means 26, positioned forward of lifting screws 12, 13, is provided with an upper generally horizontal flight positioned slightly above the upper flight of belt 19. Belt means 26 consists of a plurality of narrow parallel sections all driven in a clockwise direction with respect to FIGURE 1 by pulleys and associated chain and sprocket means. The front edges of blanks fed by conveyor means 11 passed lifting screws 12, 13 are initially supported by belt means 26 which guides the forward edges of the blanks to the lower end of barrier means 15. Such guidance is assured by slat 27 positioned just below the lower end of barrier means 15 and supports the upper flights of belt means 26.

Lifting screws 12, 13 provide a positive upward movement to the blanks in stack 14 in the vicinity of the rear portion of stack 14. At the forward portion of stack 14 the leading edge of a blank newly arrived at the bottom of stack 14 forces blanks thereabove in an upward direction. Hold down elements 28, 29 extending forwardly from hinge means 30 apply downward forces to stack 14 and pile 17 to prevent opening of the glue joints of the folded tubular boxes prior to setting of the glue. Pusher means portion 32 of delivery means 16 periodically engages the top portion of stack 14 and moves pile 17 in a forward direction.

At the end of a run of a given order of boxes, after the last blank entering conveyor means 11 has been fed to the bottom of stack 14 it is necessary to provide additional means to raise the forward end of stack 14 above front gage 32 at the upper end of barrier means 15. This is accomplished by manually operable lifting means 70 (FIGURE 5) to be hereinafter described.

The description of the apparatus illustrated in the drawings has, up to this point, been relatively brief. For a more detailed description of the basic elements of the illustrated apparatus reference is made to my aforesaid U.S. Patent 3,203,561 and my U.S. Patent Numbers 3,063,577 and 2,963,177, as well as any additional publications and/or patent applications referred to in the aforesaid patents. Accordingly, the following description will, for the most part, be limited to those elements which per se, or in combination with other elements, constitute the novel features of the instant invention.

Adjustable sections of conveyor means 11

Belt 20, though not necessarily positioned on the longitudinal center line of the apparatus, is nevertheless referred to as the center belt. It is noted that center belt 20 at its forward end is supported by wheel 41 mounted to shaft 42 with a considerable space existing between the forward end of belt 20 and lift screws 12, 13.

Each of the belts 21, 22 is of identical size and shape and is supported by identical members so that for the sake of brevity, but without sacrificing clarity, only a description of the mounting for belt 22 will be given. As best seen in FIGURE 4, belt 22 is guided along a path defined by wheels 43, 44, 45. The shafts to which wheels 44, 45 are mounted extend from movable frame member 46 pivotally mounted with shaft 42 as a pivot center. Frame member 46 is operable from its lowered position shown in the solid line in FIGURE 4 to a raised position shown in phantom in FIGURE 4. Spring 47 and stop means 48 engage frame 46 to hold the latter in its lowered and raised positions, respectively.

It is noted that with frame 46 in its lowered position, belt 22 extends forward of belt 20 (as seen in the dashed lines of FIGURE 1) to a position in line with slapper

bar 49 which is oscillated longitudinally with respect to the box feed path and is positioned so as to engage the trailing edges of blanks being raised by lifting screws 12, 13. When frame number 46 is in its raised position belt 22 extends no further forward than belt 20.

The adjustments for belts 21, 22 make possible the utilization of the apparatus illustrated for stacking both very short and very long blanks. More particularly, if frame numbers 46 were in their lowered positions of FIGURE 4 at a time when relatively long blanks were being processed, lifting screws 12, 13 would impart a considerable amount of upward movement to a blank prior to release of such blanks by belts 21, 22 in that in the lowered position of frame number 46 belts 21, 22 extend to a position extremely close to lifting screws 12, 13. Because of this relatively short distance between belts 21, 22 and screws 12, 13 and lift imparted to the blank by screws 12, 13 cause deflection of the blank to the point where it would be damaged. Hence, for relatively long blanks each of the frame members 46 must be moved to its raised position where the distance between belts 21, 22 and screws 12, 13 is relatively great so that the angle of deflection caused by the lifting of the relatively long blank while it is still engaged by belts 21, 22 will not damage this blank. Naturally, when a relatively short blank is being processed if frame 46 is in its raised position conveyor means 11 will cease exerting a positive drive force in the forward direction possibly before such short blank is fully engaged by lifting screws 12, 13 and certainly before such blank is in the vicinity of barrier means 15. Thus, for relatively short blanks it is necessary that the positive driving force by conveyor means 11 be applied to a point very close to lifting screws 12, 13.

Movable belts 21, 22 are provided with independent adjustments in order to accommodate the handling of die cut blanks having trailing edges in which one side extends considerably more to the rear than the other side, such as blank 51 (FIGURE 3) with portion 51*a* extending considerably more to the rear than portions 51*b*. If both of the belts 21, 22 could only be adjusted simultaneously, the only adjustment that would not damage blank 51 would be to raise both belts 21, 22. However, if this is done a positive driving force ceases to act on portion 51*b* at a time considerably in advance of the time when positive a driving force ceases to operate on portion 51*a* and because of this blank 51 would cock and cause the apparatus to malfunction.

Thus, instead of adjusting both belts 21, 22 to their upward positions, as seen in FIGURE 3, belt 22 is adjusted to its upward position while belt 21 is in its lowered position. With such adjustment the release of portion 51*b* by belt 21 occurs at approximately the same time as the release of portion 51*a* by belt 22 so that a positive drive exerted uniformly on both sides of blank 51 is effective to a point where blank 51 is well under the control of lifting screws 12, 13 and the forward movement of blank 51 is arrested by barrier 15.

Front barrier means

Front barrier means 15, shown most clearly in FIGURE 5, provides a vertically extending wall with a lower portion 15*a* and an upper portion 15*b* forwardly offset from portion 15*a*. The step between portions 15*a*, 15*b* is gradual and takes place at a transition region formed by a peripheral portion 62 of roller means 63 which is continuously rotated by motor 64 in the direction indicated by arrow A in FIGURE 5 about shaft 65 as a center. Thus, peripheral portion 62 provides an upwardly and forwardly sloping surface moving upwardly.

It is noted that peripheral portion 62 is illustrated as extending for less than 90° and that lower portion 15*a* is tangent to peripheral portion 62 with the upper end to portion 15*a* terminating at the tangent point. While this configuration has been found to produce superior results when folded tubular boxes of corrugated paper board tent of peripheral portion and its position relative to barrier portions 15*a*, 15*b* may be varied when handling different articles or to achieve different results in a particular area.

As each blank enters stack 14, being driven forward by momentum and the action of belt means 26, it wedges its way between belt means 26 and the bottom stack 14. Lower barrier portion 15*a* arrests forward movement of the newly entering blank by engaging its leading edge. As additional blanks enter stack 14 from below the forward portions thereof are wedged into position at the bottom of stack 14 forcing the forward portions of blanks thereabove to move upwardly at essentially the same rate as lifting screws 12, 13 impart upward movement to the rear portions of these blanks. When the leading edge of a blank moving upwardly in stack 14 reaches the top of lower barrier portion 15*a*, this leading edge is engaged by the knurled periphery of roller means 63 at its peripheral portion 62. The upward and forward movement of peripheral portion 62 draws the blank in engagement therewith away from the portion of stack 14 below this blank thereby removing the weight of this blank and all blanks thereabove from the portion of stack 14 below this blank.

It is noted that slapper bar 49, which is vibrated generally parallel to the blank feed path as indicated by line V in FIGURE 5, imparts hammerlike blows to the trailing edges of the blanks in stack 14 directed towards barrier means 15 to effect a straightening action to these blanks as fully described in my aforesaid U.S. Patent No. 3,203,561.

For purposes of describing the instant invention it is sufficient to note that the forward surface of slapper bar 49 is provided with a forward surface having generally vertical sections 49*a*, 49*b* joined by forwardly sloping transition section 66. Upper section 49*b* is positioned forward of lower section 49*a*. It is noted that transition section 66 essentially complements peripheral portion 62 so that as the leading edge of a blank is drawn upwardly and forwardly by peripheral portion 62 the trailing edge of this blank is in engagement with the forwardly sloping transition section 66, and that at the time that the leading edge of this blank engages upper section 15*b* the upper section 49*b* of slapper bar 49 will be effective to continue with the straightening action.

Manually operated stack lifting means

At the end of a run there are no additional blanks entering stack 14 to lift the forward portion of the bottom blank in the stack. Thus, even though lifting screws 12, 13 continue to lift the rear portion of the entire stack to delivery position above the upper end of front barrier portion 15*b*, delivery cannot be effected. Accordingly, the instant invention provides manually operated lift means indicated generally by reference to mode 70 in FIGURE 5.

As previously noted, conveyor belt means 26 is comprised of a plurality of narrow belts positioned parallel to one another and spaced transversely with respect to the generally horizontal feed path for the blanks. Lift means 70 includes transversely extending pivotally mounted support rod 71 to which a plurality of members 72 are mounted. Each of the members 72 is of generally U-shaped with one arm 72*a* considerably longer than the other arm 72*b*. Wheel 73 is rotatably mounted at the free end of arm 72*a* while the free end of arm 72*b* is fixedly secured to rod 71. Arms 72 are transversely spaced along rod 71 so that each of the rollers 73 is positioned in alignment with a different space between the sections forming belt means 26. L-shaped crank 74 is fixedly secured at one of its ends to rod 71 while the other end of crank 74 is provided with transversely extending handle 75.

When belt means 26 is not supporting any blanks the upper flight thereof is essentially aligned with the most upwardly extending points of rollers 73 in the lowered

of crank 74 with stop 76. As a stack of blank 14 is being formed, belt means 26 begins to sag so that the front end of stack 14 is now supported by rollers 73 thereby relieving belt means 26 from supporting the weight of stack 14.

After the last blank in a particular run has its forward movement arrested by barrier means 15, crank 74 is manually operated in a clockwise direction about rod 71 as a center thereby raising roller 73 to the phantom position of FIGURE 5. The raised position for lift means 70 is established by engagement of arms 72 with bar 27. In this raised position of lift means 70 the bottommost blank in the stack 14 is positioned with its forward end above the upper end of upper barrier section 15*b*. Thus, when lifting screws 12, 13 lift the rear end of the bottommost blank in stack 14 to a position for engagement by pusher means 32 the remaining portion of stack 14 will be delivered by pusher 32 to conveyor 18.

Pusher means

The driving and stabilizing means 79 (FIGURE 1) for pusher means 32 forms no part of the instant invention so that a detailed description thereof will not be given herein except to note that such mechanism is described in detail in my patents hereinbefore noted.

While pusher means 32 consists of two identical sections 32*a*, 32*a* only one of these sections is illustrated (see FIGURES 6 and 6A). Both pusher means sections 32*a*, 32*a* occupy positions in a single plane perpendicular to the blank feed path and are usually positioned on opposite sides of this feed path. As will hereinafter become apparent, the transverse positions of the pusher means sections are independently adjustable as are the lowermost positions thereof.

Pusher means 32*a* is connected to the chains 79*a*, 79*b* of driving means 79 by vertically spaced laterally extending frame rails 83*a*, 83*b* whose opposite ends are connected to different vertical tie rods 83, 83 connected directly to link of chains 79*a*, 79*b*.

Vertically extending guide bar 84 is slidably mounted to rails 83*a*, 83*b* by gibs 82*a*, 82*b*, respectively. Clamp means 82*c* associated with gib 82*b* clamps vertical guide bar 84 in its adjusted position along the lengths of rails 83*a*, 83*b*.

At a point below gib 82*b* bolts 85*a* secure lateral guide block 86 to bar 84, adjusting rod 92, threaded at its upper end extends downward through clearance aperture 91*a* in block 86. The lower end of rod 92 is affixed to stop plate 87 while knurled adjusting nut 93 is threadably mounted to rod 92 above block 86. Rod 89 extends downward from block 86 through clearance aperture 91 in plate 87 to stabilize plate 87 against rotation as nut 93 is rotated. Coiled compression spring 92*a* mounted to rod 92 biases plate 87 downward to its adjusted position established by the position of nut 93 along rod 92. The lower end of guide bar 84 extends downwardly into the upper end of tubular pusher 85 which, as seen in FIGURE 1, is the portion of pusher means section 32*a* which engages the rear of stack 14 to remove pile 17 therefrom. Pusher 85 is biased downwardly by gravity with its downward movement being limited by ear 86 which extends laterally from pusher 85 to engage the upper surface of adjustable platelike stop member 87. Wheels 98, 99 mounted to bar 84 are positioned to engage the front and back inner surfaces, respectively, of pusher 85 and thereby reduce friction acting to impede upward movement of pusher 85 relative to bar 84 during delivery of pile 17 from the top of stack 14. In this connection it is noted that wheel 99 is positioned above wheel 98. Pusher means section 32*a* is intended to be adjusted while delivery means 16 is in operation and preferably just prior to engagement of pusher 85 with the rear of stack 14. By turning nut 93 the position of stop plate 87 is adjusted vertically with respect to bar 84 and rails 83*a*, 83*b* thereby establishing the lowermost position for pusher 85. This lowermost position for pusher 85 is the position it will occupy at the moment of engagement with the rear of stack 14. During the interval when pusher 85 is delivering pile 17, lifting screws 12, 13 continue to raise stack 14 and in so doing the portion of stack 14 below pusher 85 causes upward movement thereof with this movement being permitted by the telescoping relationship of vertical guide 84 and tubular pusher 85. The position of adjusting nut 93 is such that it may be conveniently reached by an operator so that the operator may observe the exact position of pusher 85 relative to stack 14 at the moment of initial engagement with stack 14 and make necessary corrective adjustment of member 87 before the next cycle of pusher means 32.

The adjustment of pusher means section 32*a*, 32*a* are made independently of each other since different sizes of blanks and blanks contructed of different types of materials present panels which are differentially positioned with respect to each of the pusher means sections 32*a*, 32*a*. It is essential that the pushers 85 of both sections 32*a*, 32*a* be positioned to positively engage the lowermost blank in pile 17 at the instant of initial engagement. If only one of the pushers 85 engages the bottommost blank in pile 17 this blank will skew and cause jamming of the apparatus.

Thus, it is seen that the instant invention provides an improved stacking and delivery device which includes novel adjustable belt means for delivering blanks to a stacking section which includes novel rotatable wheel means constituting a transition section between upper and lower vertical barrier sections with the upper section being forwardly set with respect to the bottom section. Also included are novel manually operated means to lift the stack of blanks at the forward end thereof to facilitate removal at the end of a run, and novel takeoff means having a plurality of independently adjustable pusher means section.

Although there has been described a preferred embodiment of this novel invention, many variations and modifications will now be apparent to those skilled in the art. Therefore, this invention is to be limited, not by the specific disclosure herein, but only by the appending claims.

I claim:

1. In the combination of a machine for operating on box blanks and delivery apparatus adapted for use with said machine; said apparatus comprising a stacking means and a conveyor means extending between said machine and said stacking means; said conveyor means receiving blanks issuing from said mechanism and moving these blanks forward along a generally horizontal feed path to said stacking means; said conveyor means including first and second sections, one above and the other below said feed path; said sections mounted in opposed relationship and both being positioned to engage blanks moving along said feed path and drive these blanks forward; the improvement comprising adjustable mounting means for selectively positioning said first section at a first and a second position while said second section remains in fixed longitudinal position along said feed path; when in said first position said first section after engaging a blank thereafter releasing this blank at a first point of said feed path; when in said second position said first section after engaging a blank thereafter releasing this blank at a second point of said feed path; said first and said second points being longitudinally spaced along said feed path with said second point positioned forward of said first point.

2. A combination as set forth in claim 1 in which said first section includes first and second portions disposed on opposite sides of a longitudinal center line for said feed path; each of said portions mounted for independent adjustment to said first and said second positions.

3. A combination as set forth in claim 1 in which said first and said second sections are comprised of first and second continuous belt means, respectively; a greater length of said first belt means being directly opposed to said second section when said first section is in said second position than when said first section is in said first position.

4. A combination as set forth in claim 3 in which the mounting means includes pivot means about which said first section is bodily movable as a unit to said first and said second positions; said pivot means positioned in the vicinity of said first point; guide means for said first belt means including a member rotatable about said pivotal axis; said first belt means including a lower flight extending from said first point forward to said second point when said first section is in said second position.

5. In the combination of a machine for operating on box blanks and delivery apparatus adapted for use with said machine; said apparatus comprising a stacking means and a conveyor means extending between said machine and said stacking means; said conveyor means receiving blanks issuing from said mechanism and moving these blanks forward along a generally horizontal feed path to said stacking means; said stacking means including first means for imparting upward movement to blanks as they enter said stacking means; said stacking means including a second means providing a barrier means positioned forward of said first means; said barrier means extending generally vertically above said feed path and positioned to engage leading edges of blanks moving along feed path to thereby arrest forward movement of these blanks; the improvement comprising the construction of said barrier means with upper and lower surface portions, said upper and lower surface portions being stationary and rigid, said upper surface portion disposed at a location stepped forward of said lower surface portion.

6. A combination as set forth in claim 5 in which the stacking means forms a stack of blanks that is fed from the bottom; a delivery means which periodically removes the top portion of the stack from said stacking means; lifting means including a member engageable with the bottommost blank in the stack at a point forward of said first means, in the vicinity of said barrier means and to the rear thereof; said momber normally stationary in a lowered position and being movable to a raised position to thereby lift the bottommost blank to a position where the delivery means removes such bottommost blank from said stacking means together with all those blanks in the stack above such bottommost blank.

7. A combination as set forth in claim 5 in which the stacking means forms a stack of blanks that is fed from the bottom; a delivery means which periodically removes the top portion of the stack; said delivery means including pusher means operated in timed relation with said first means, means for guiding movement of said pusher means in a raised path while moving rearward and in a lowered path while moving forward; said pusher means when in said raised path being above the topmost blank in said stack and when in said lowered path engaging said top portion at the rear thereof and moving said top portion forward of said barrier means; said pusher means including a first pusher and a second pusher positioned side by side, means mounting said pushers for vertical movement independent of one another, first and second stop means for limiting downward movement of said first and second pushers, respectively, and means for making independent adjustments of said first and second stop means.

8. A combination as set forth in claim 9 including a slapper means oscillating generally parallel to said feed path and positioned rearward of said first means and engageable with said blanks at the trailing edges thereof as said blanks are being lifted by said first means; said slapper means having a forwardly and upwardly sloping section positioned to engage blanks that are in engagement with said transition section; said slapper means including additional sections positioned to engage blanks that are in engagement with said upper and said lower surface portions.

9. A combination as set forth in claim 5 in which the barrier means also includes an upwardly and forwardly sloping transition section positioned between said upper and said lower surface portions.

10. A combination as set forth in claim 9 in which there is a rotatable wheel means having a peripheral portion constituting said transition section.

11. A combination as set forth in claim 10 also including means imparting continuous rotation to said wheel means.

12. A combination as set forth in claim 11 further including means defining a rotational axis for said wheel means, said rotational axis positioned forward of said lower portion of said barrier means, said lower portion of said barrier means being tangent to said peripheral portion.

13. A combination as set forth in claim 12 in which said peripheral portion extends for no more than ninety degrees.

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United States Patent

[11] 3,601,265

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[21] Appl. No. 779,459
[22] Filed Nov. 27, 1968
[45] Patented Aug. 24, 1971
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[54] BLANK STACKING, STRAIGHTENING AND DELIVERY MEANS

7 Claims, 8 Drawing Figs.

[52] U.S. Cl. ..... 214/6 BA, 271/75, 271/86
[51] Int. Cl. B65g 57/30
[50] Field of Search 214/6.2; 271/86, 76, 75

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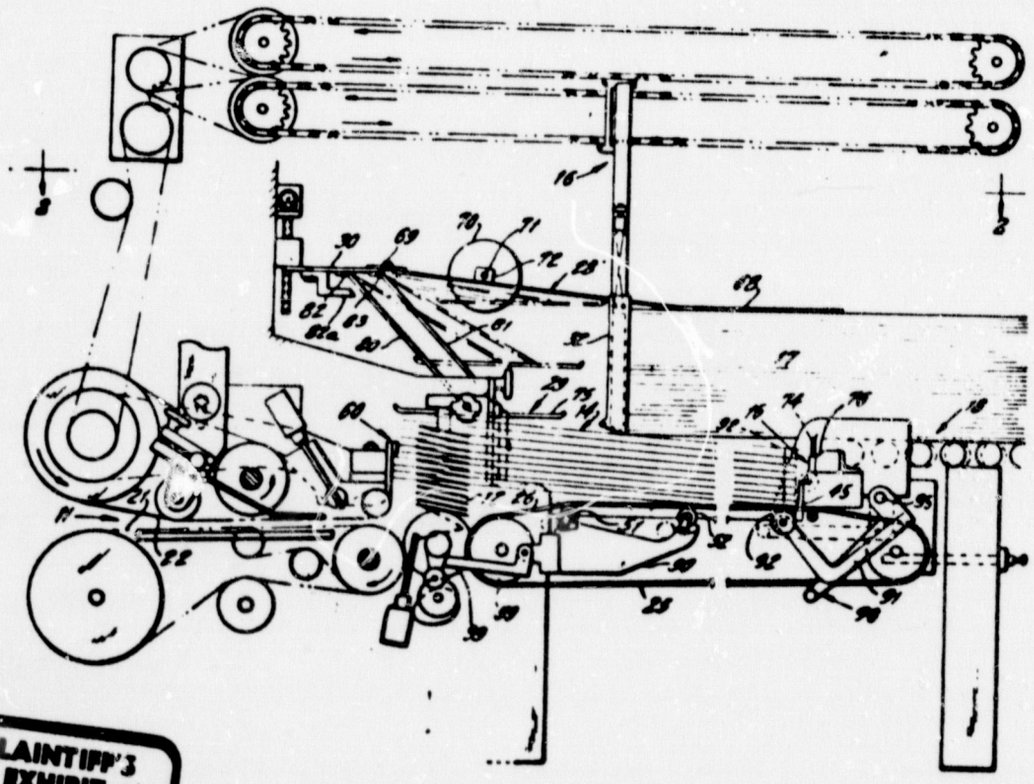
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ABSTRACT: Apparatus for stacking and straightening folded tubular boxes is constructed with a front barrier, which arrests forward box movement, having offset upper and lower vertical portions with the lower portion having a downward and rearwardly inclined section at the bottom thereof. A longitudinally oscillating slapper bar for engaging the rear of the stack is positioned opposite the vertical sections of the barrier and is disposed above the incline in the barrier. The inclined portion of the front barrier serves to prevent excessive buildup of weight in the stack from impeding the entry of boxes being fed to the bottom of the stack. Lift screws prevent excessive buildup of weight at the rear of the stack while oscillating roller means engaging the stack from below prevent excessive buildup of weight at the front of the stack.

A roller device movable with the front barrier supports the continuous belt means which delivers folded boxes to the stacking section and supports the upper flight of this belt means in the critical area adjacent the front barrier. Additional roller means are selectively positionable to support additional portions of the delivery belt as required. Mounting for the roller means is such that they are automatically moved to retracted positions as the barrier means moves past in adjusting the apparatus for operation on shorter boxes.

A slat hinged at one end thereof and supporting a roller acts to exert a downward force on the stack of boxes in the stacker with the roller being positioned toward the rear of the stack to prevent the portion of the stack engaged by lift screws from rising faster than the leading edge of the stack and thereby tipping the leading edge downward to impede takeoff. Another member also exerts a downward force on the stack primarily at the rear thereof. This member is maintained in a horizontal position by means of parallel linkages in an effort to maintain the folded boxes in the stack in horizontal position.



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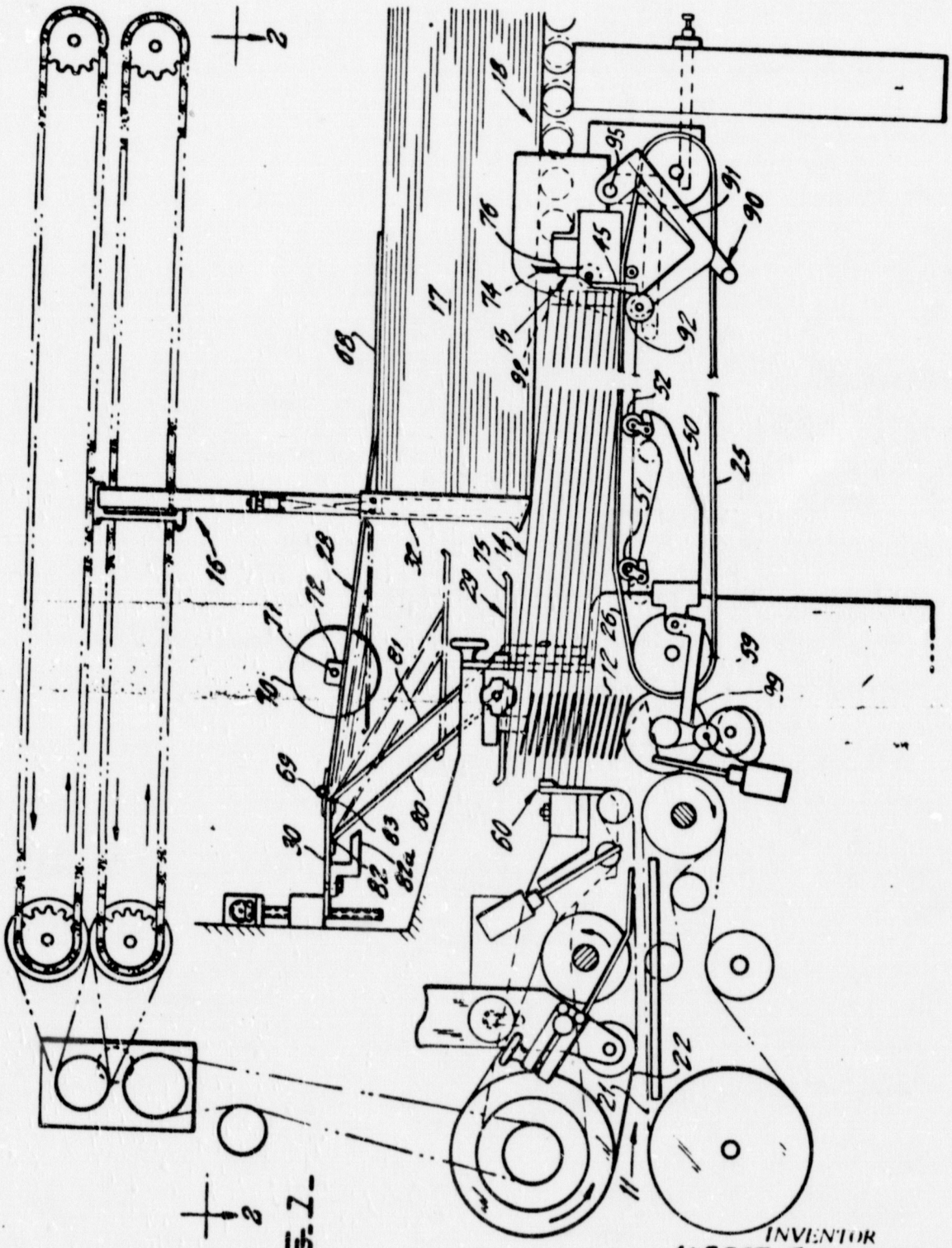


FIG. 1.

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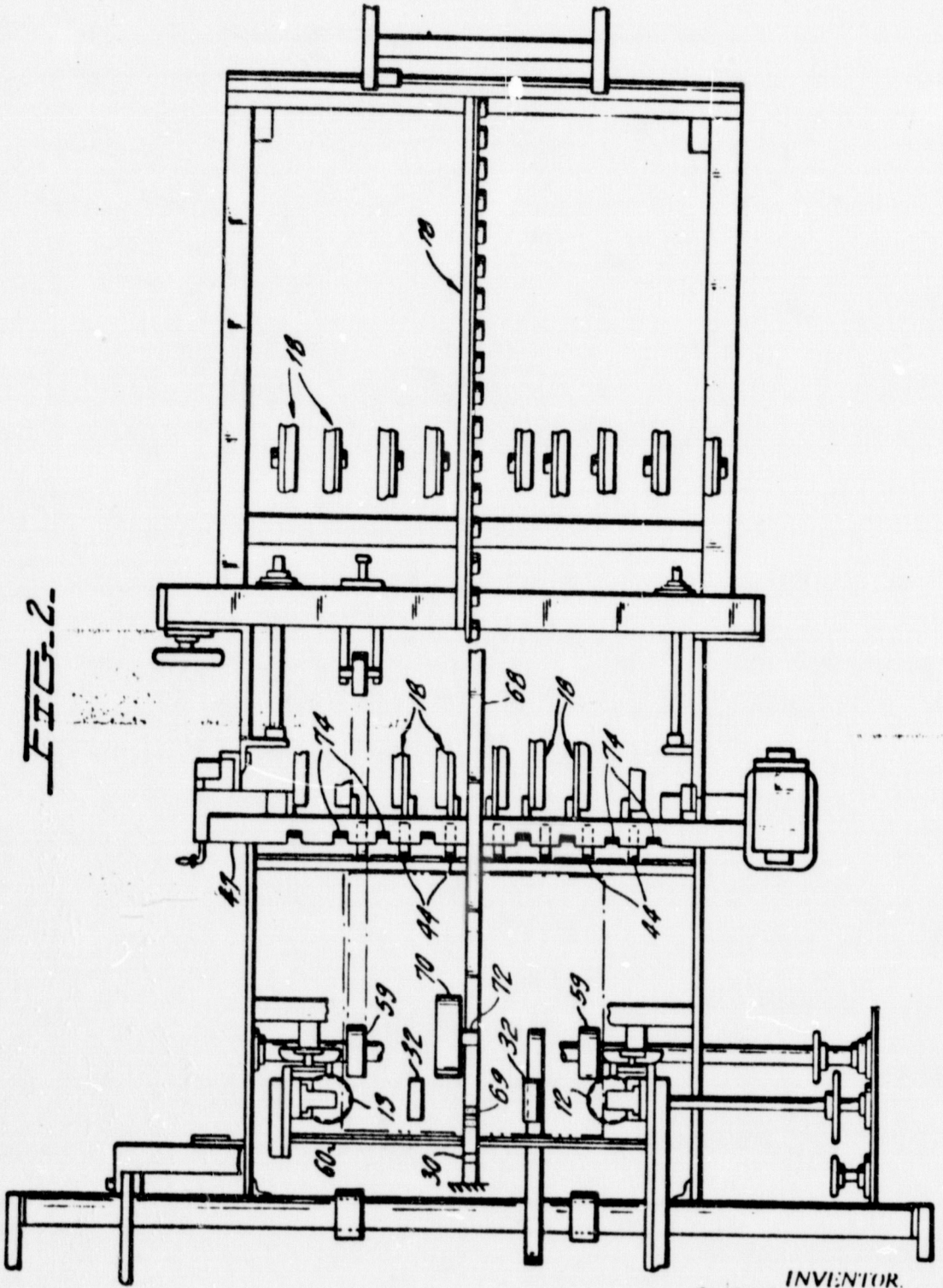
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FIG. 2.



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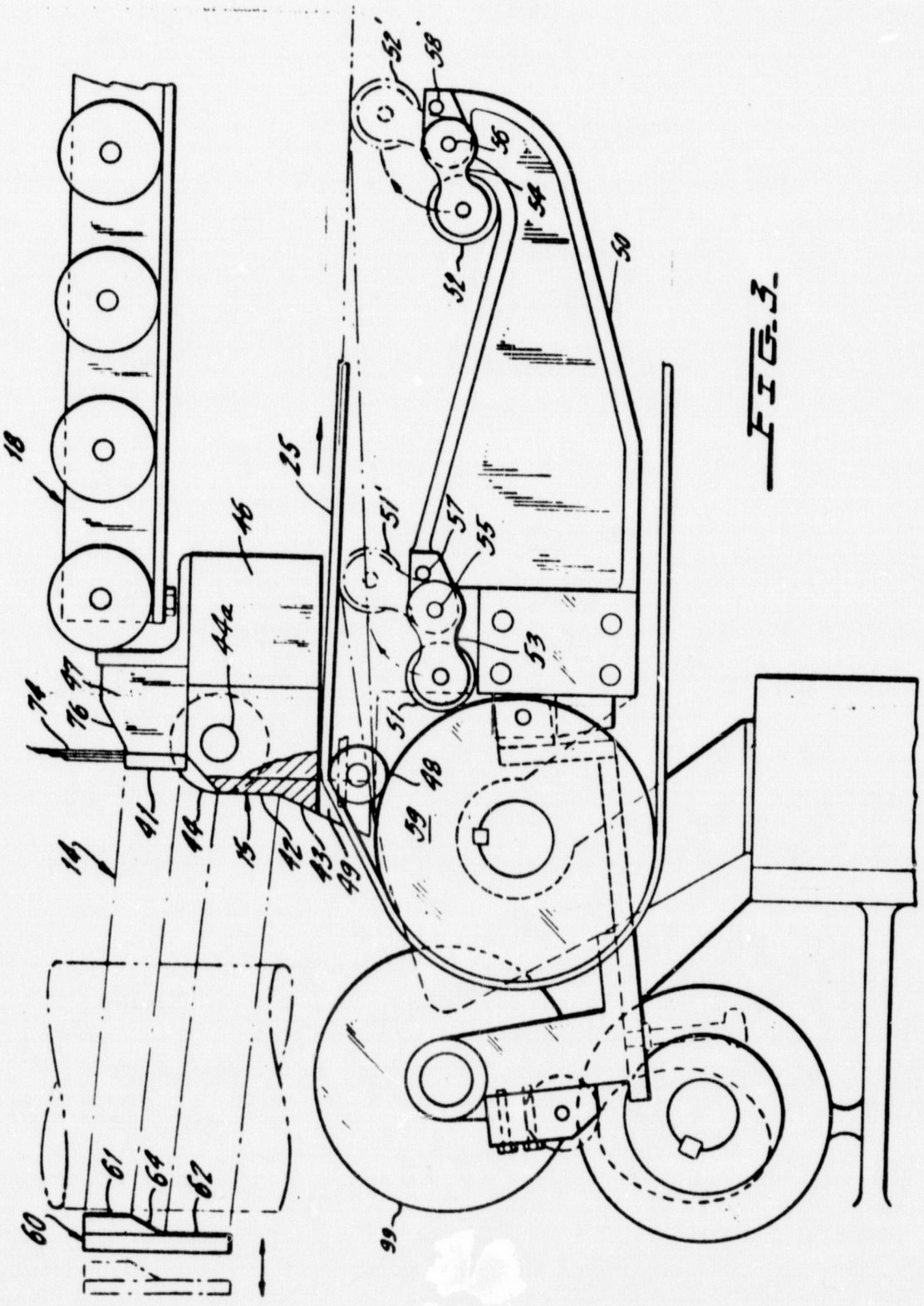


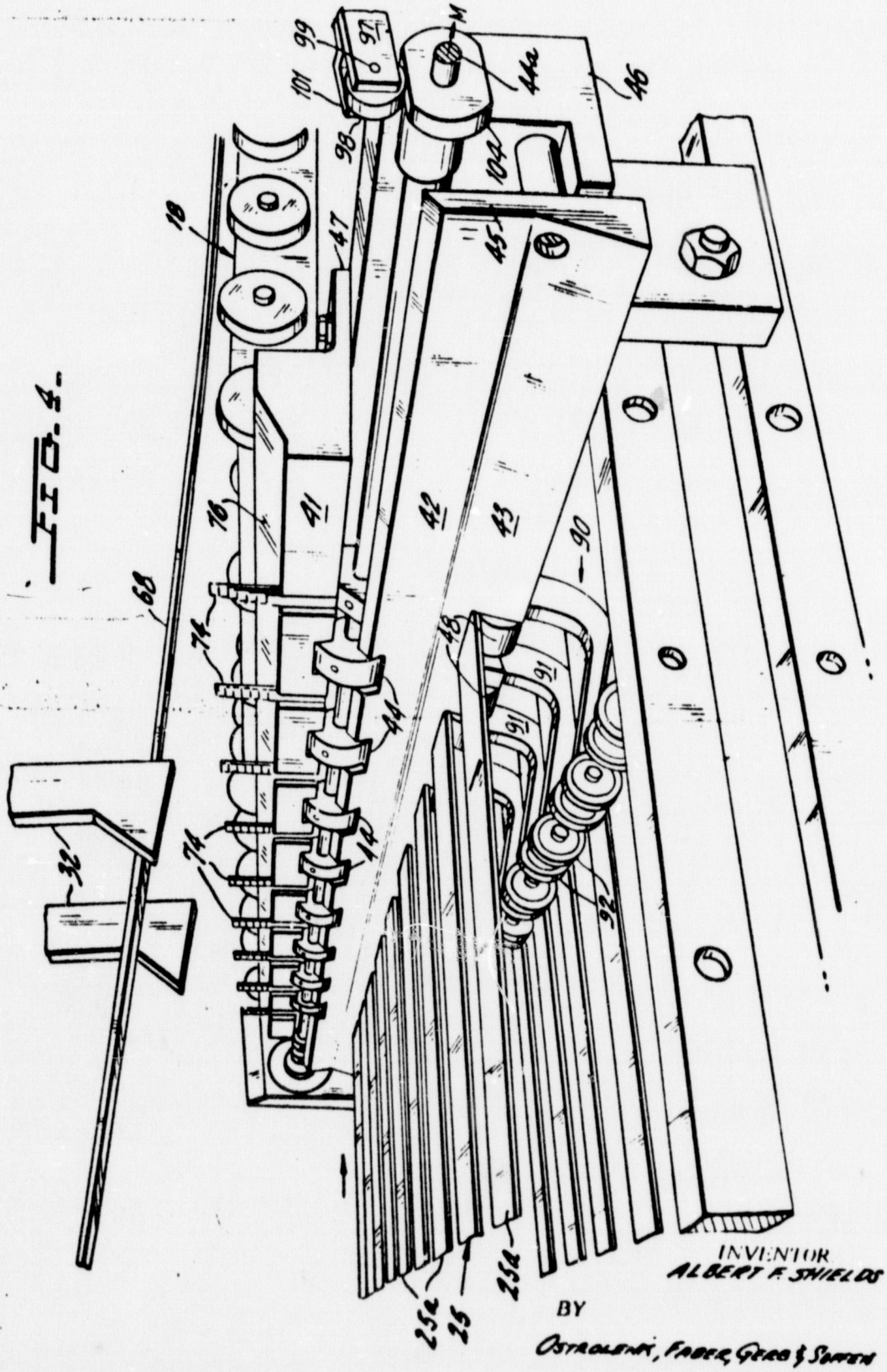
FIG. 3

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FIG. 4.



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Plaintiffs' Exhibit 33 - Shields' Patents

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FIG. 5.

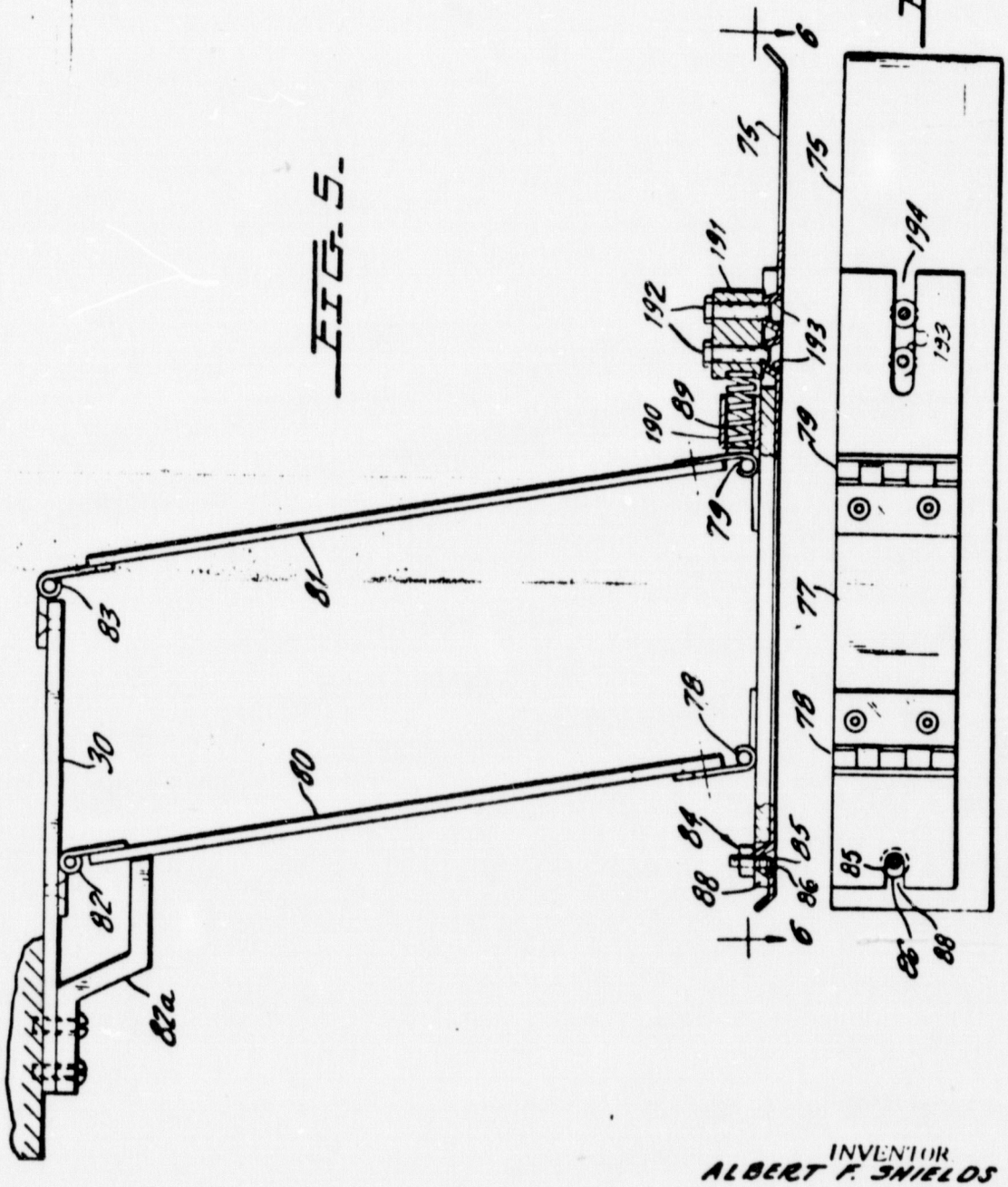


FIG. 6.

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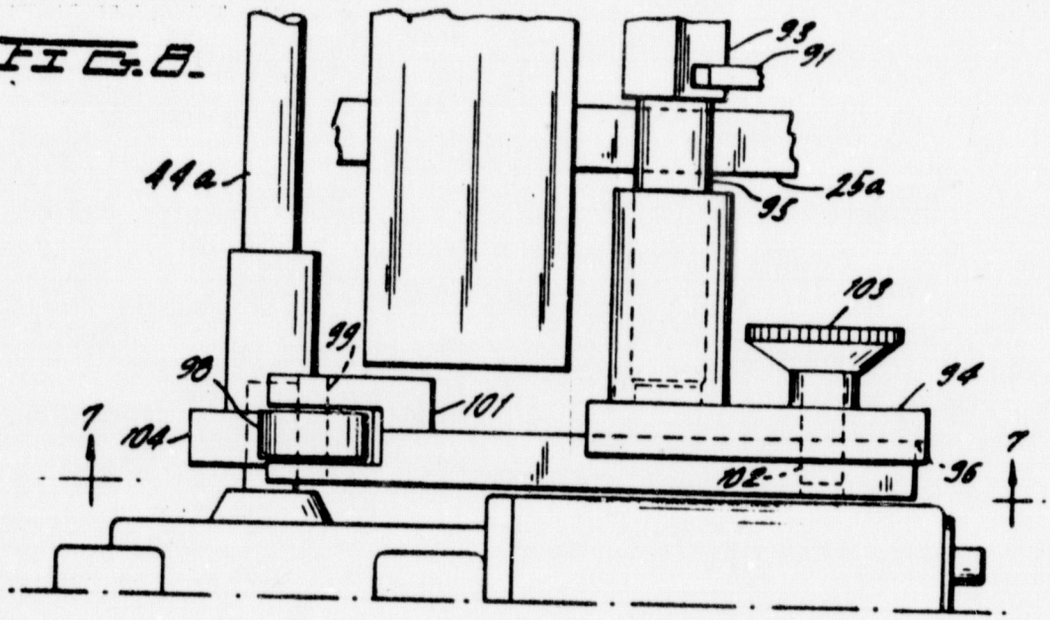
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FIG. 8.



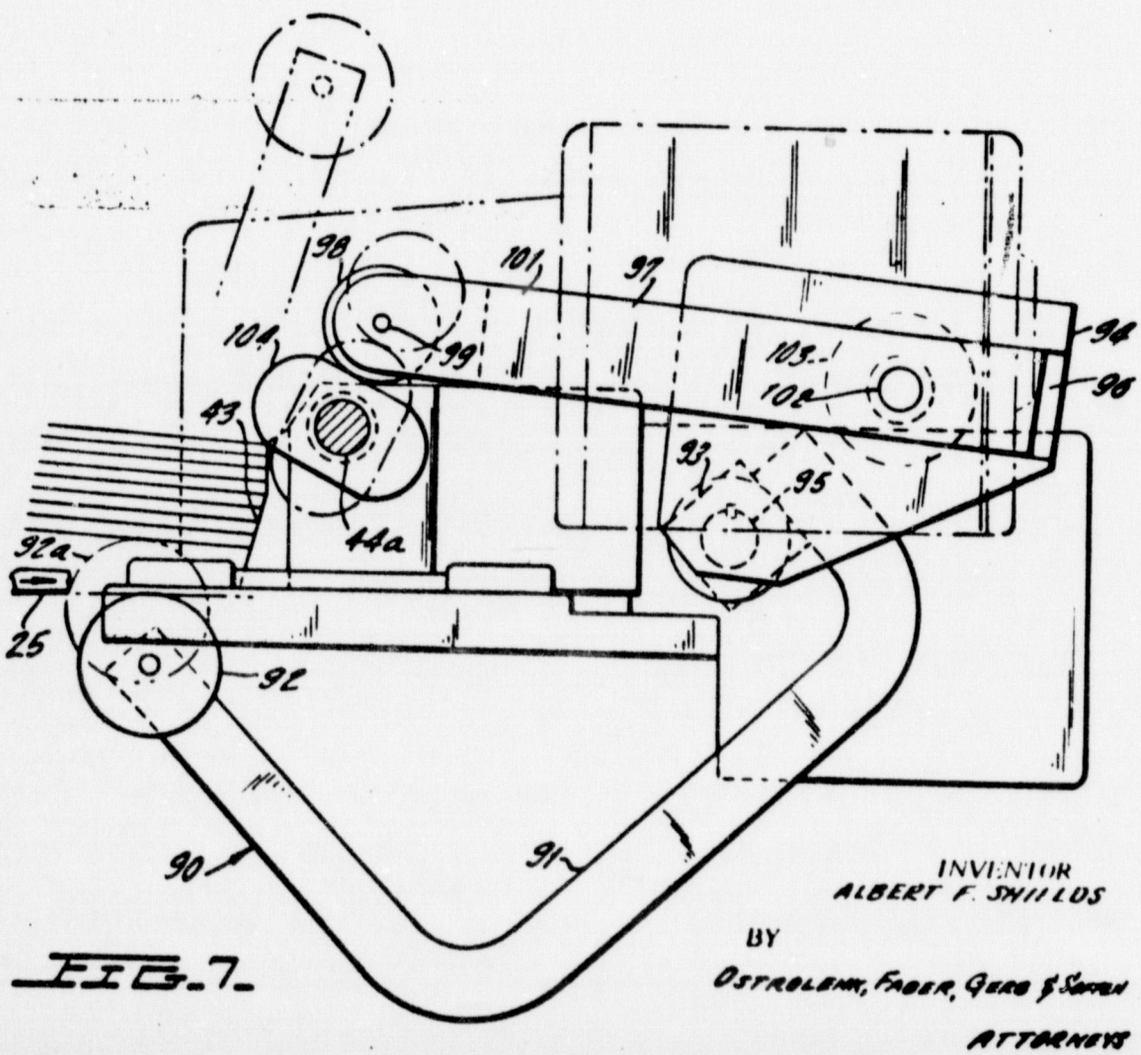


FIG. 7.

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BLANK STACKING, STRAIGHTENING AND DELIVERY MEANS

This invention relates to apparatus for producing boxes from corrugated board and more particularly relates to an improved construction for the stacking, straightening and delivery section of the apparatus disclosed in my copending U.S. application Ser. No. 516,421 filed Dec. 27, 1965, now Pat. No. 3,409,148 for an Improved Stacking Device.

Apparatus of the type under consideration includes feed belts which receive blanks issuing from a folding machine as folded tubular boxes and conveys these folded blanks along a generally horizontal feed path to a location where the side edges of the blanks are engaged by lifting screws positioned on opposite sides of the feed path. Shortly thereafter forward movement of the folded blanks is arrested by engagement of the leading edges of the blanks with a vertically extending barrier positioned forward of the lifting screws. The lifting screws raise the blanks above the feed path to form a bottomfed stack, the top portion of which is engaged periodically by a pusher means operated in timed relationship with the lifting screws. The pusher means moves horizontally from the rear to remove a pile of folded blanks from the top portion of the stack with the pile containing a predetermined number of blanks.

In the apparatus of my aforesaid copending application Ser. No. 516,421 a slapper bar positioned above the feed path engages the rear edges of the folded blanks while the front edges thereof are in engagement with the barrier. However, there is a space between the feed belts defining the feed path and the slapper to the barrier. The lifting screws are located near the slapper bar to positively impart upward movement at the rear of the folded blanks. However, there is no means positively lifting the forward edges of the folded blanks as they engage the barrier and as a result the lifting of the blanks at the rear end tends to tip the front downward. This condition is further accentuated in that the weight of the folded blanks from above resting upon the lower blanks in the stack so that the leading edge of the bottommost blank in the stack tends to hand on to the conveyor belts and impedes the ability of the next blank being delivered from reaching the barrier.

In order to alleviate this latter condition, the lower vertical surface of the barrier is provided with a downward extension that slopes toward the rear i.e. toward the feed end of the machine. This provides an upward forwardly sloping incline onto which the forward edges of the folded blanks initially rise as their forward progress is arrested by the barrier means. This serves to relieve the downward force acting on the lowermost folded blank in the stack to readily permit entry of succeeding blanks at the bottom of the stack. Entry of preceding blanks is also facilitated by an oscillating roller means that moves between a position below the feed path to one slightly above and engages the lowermost blank in the stack from below at the front thereof.

To permit the apparatus to accommodate different sizes of folded blanks, the barrier means position is adjustable front and back to a selected position along the feed path. It is very important that the feed belts do not sag in the region where the feed belts intersect the barrier. Thus, a belt-supporting guide roller is connected to the barrier means and is movable therewith. While longer blanks are being handled, it is important that the conveyor belts do not sag rearward of the barrier. For this purpose a plurality of roller supports are provided with each being mounted to arms that are pivoted so as to be selectively movable between a lowered position, in which the roller means does not support the belt, to a raised position, in which the belt is supported by the roller means. These arms are so mounted that rearward movement of the barrier causes the guide roller carried thereby to engage the arms for automatic movement thereof to positions therein wherein the roller means becomes disengaged from the belt means.

In order to prevent opening of the glued or taped joints of the folded blanks, the blanks in the stack rest against one another and a slat resting against the top of the stack exerts a downward force to maintain pressure between adjacent folded blanks. A parallel arm linkage supports the slat in a manner which permits upward movement thereof as stack height increases, yet maintains the slat essentially horizontal to achieve greater accuracy in the count of folded blanks in each pile removed from the top of the stack.

Accuracy is further improved by a weight roller positioned to exert a downward force at the rear of the stack to counteract the positive lifting force of the screws so as to prevent the rear of the stack from rising much faster than the front of the stack which, as previously noted, does not have positive lifting forces exerted thereon. The last recited roller is mounted to a hinged hold down bar or slat at a point forward of the slat rear and where its hinged support is found. This last mentioned slat extends considerably beyond the barrier means to exert a downward force on the pile all during the time when it is moved forward of the barrier means.

Accordingly, a primary object of the instant invention is to provide a novel construction for the stacking, straightening and delivery section of box making machinery.

Another object is to provide a stacking section in which means are provided to reduce forces impeding entry of blanks to the bottom of the stack.

Another object is to provide movable roller means for supporting a conveyor belt in the region where this belt intersects a barrier means which arrests forward movement of folded blanks moving in a horizontal path.

A further object is to provide novel means for selectively positioning belt support rollers.

A further object is to provide a replaceable slat means for exerting holding pressure on joints of folded blanks in a stacking section and to provide means for maintaining said slat generally horizontal.

Yet another object is to provide a roller means mounted to a hinge slat for exerting downward force at the rear of a stack of blanks in which the blanks are being raised at the rear by lift screws.

These, as well as other objects of this invention, will become readily apparent after reading the following description of the accompanying drawings in which:

FIG. 1 is a side elevation of a stacking, straightening and delivery section constructed in accordance with teachings of the instant invention.

FIG. 2 is a plan view, looking in the direction of arrows 2–2 of FIG. 1, showing the portion of the apparatus of FIG. 1 below the belts which drive the delivery means.

FIG. 3 is an enlarged side elevation showing the belt support rollers.

FIG. 4 is a fragmentary perspective showing elements in the region of the front barrier means.

FIG. 5 is an enlarged side elevation of the holddown slat and its parallel linkage mounting.

FIG. 6 is a plan view of the slat of FIG. 5 looking in the direction of arrows 6–6 of FIG. 5.

FIG. 7 is a side elevation through line 7–7 of FIG. 8, illustrating means for oscillating the lifting means while blanks are being stacked.

FIG. 8 is a plan view of the elements of FIG. 7.

Now referring to the figures. The portions of the box making apparatus incorporating the novel features of the instant invention include conveyor means 11 which receive box blanks in folded tubular form from a folder-gluer or folder-taper (both not shown) positioned to the left of FIG. 1. Conveyor means 11 moves the blanks forward along a generally horizontal feed path delivering them to lift cam operated roller 99 and lift screws 12, 13. The threads of screw means 12, 13 engaged the edges of the folded blanks to impart upward movement to such blanks to form stack 14 which is fed from below. Forward movement of the folded blanks is arrested by front barrier means 15 shown enlarged in FIGS. 3

and 4. Delivery means 16, positioned above stack 14, periodically engages the upper portion of stack 14 to remove a pile 17 of blanks from the top of stack 14 and deliver such pile 17 in a forward direction on to the rollers of conveyor table 18.

Conveyor means 11 comprises opposed continuous belt means 21, 22 which engage folded blanks therebetween delivering them forward (to the right with respect to FIG. 1) to the upper flight of delivery belt means 25 which is supported so that the upper flight at the left thereof provides an upwardly inclined entrance portion 26. The front edges of blanks fed by conveyor means 11 pass lifting screws 12, 13 and are initially supported by belt means 25 which guides the forward edges of the blank to the lower portion of barrier means 15. Lifting screws 12, 13 provide positive upward movement to the blanks of stack 14 in the vicinity of the rear portion of stack 14. At the forward portion of stack 14 the leading edge of a blank newly arrived at the bottom of stack 14 forces blanks thereabove in an upward direction. Hold-down sections 28, 29 extending forwardly from frame member 30 provide downward forces acting on stack 14 and its top pile 17 to prevent the glued or taped joints, as the case may be, of the folded tubular boxes from opening prior to setting of the glue. The pair of pushers 32, 32 of delivery means 16 periodically engage the top portion of stack 14 at the rear thereof and move pile 17 in a forward direction or to the right with respect to FIG. 1.

At the end of a run of a given order of boxes, after the last folded box blank entering conveyor means 11 has been fed to the bottom of stack 14, manually operable lifting means 90 is operated to raise the forward end of stack 14 above front gauge 41, at the upper end of barrier means 15, for engagement and removal by pushers 32, 32.

Since details of the chains and sprockets connecting the power source (not shown) to the elements of the apparatus for operation in timed coordinated relationship form no part of the instant invention and are within the knowledge of those skilled in the art, descriptions thereof are not contained herein.

The description of the apparatus illustrated in the drawings has, up to this point, been relatively brief. For a more detailed description of the basic elements of the apparatus illustrated, a reference is made to my U.S. Pat. Nos. 3,203,561, 3,063,577 and 2,963,177, to my aforesaid copending application Ser. No. 516,421, as well as to additional publications and/or patent application referred to in the aforesaid patented documents. Accordingly, the following description will, for the most part, be limited to those elements which per se, or in combination with other elements, constitute the novel features of the instant invention.

Particular attention is directed to FIGS. 3 and 4 for a detailed showing of front barrier 15 which includes upper vertical section 41 spaced from and offset to the rear of lower vertical section 42, the latter being part of transverse member 45. Peripheral portions of continuously rotating rollers 44 provide a transition between vertical sections 41 and 42. Inclined portion 43 of barrier means 15 extends to the rear and downwardly from lower vertical portion 42. The upper flights of the plurality of spaced parallel narrow belt sections 25a, constituting delivery belt 25 extend through notches in transverse member 45 which provides barrier means sections 42 and 43. Member 45 is connected to movable frame member 46 which also carries member 47 having barrier means surface 41 formed thereon.

A plurality of rollers 48 pivotally mounted to the right of member 45 in FIG. 4 support the upper flight of each of the belt sections 25a very close to the point where section 25a intersects barrier means 15. the upper flight of each of the belt sections 25a is also supportable by rollers 51 and 52, rotatably mounted at one end of the arms 53,54 respectively. Pins 55, 56 pivotally mount links or arms 53,54 respectively to stationary bracket 50 at the ends of arms 53,54 remote from rollers 51,52.

With rollers 51,52 in their lowered or inactive positions shown in FIG. 3 they are below the upper flight of delivery belt 25 and do not provide support therefor. This condition prevails when relatively short blanks are being handled. At this time, movable frame supported rollers 48 are adjacent to main support roller 59 at the forward end of delivery belt 25.

With arms 53,54 pivoted clockwise to the phantom positions shown in FIG. 3, rollers 51 and 52 rise to positions supporting the upper flight of delivery belt 25 and remain in this position since pins 57,58 limit clockwise movement of arms 53,54 respectively to a position slightly to the right of center with respect to pivots 55,56. When front barrier means 15 is moved from the position shown in FIG. 1 leftward to the position shown in FIG. 3, as rollers 48 move past rollers 51,52 engagement therebetween moves arms 53,54 in a counterclockwise direction to automatically operate rollers 51,52 to their inactive positions shown in FIG. 3.

The mechanism for oscillating arms 91 of lifting means 90 is seen more particularly in FIGS. 4, 7 and 8 but for the sake of clarity is omitted from FIG. 1. Each of the arms 91 carries freely mounted rollers 92 at one end thereof movable between belt sections 25a. The other end of arm 91 is secured to member 95 which is a square bar 93 turned at both ends to provide journals 95 pivotally mounted on movable frame 46. Member 94, keyed at one end of journal 95, is provided with generally horizontally slot 96 which receives arm 97 having cam follower roller 98 pivotally mounted on pin 99 at the bifurcated end 101 of arm 96. Near the other end of arm 97, threaded aperture 102 therein receives thumb screw 103 which extends through a clearance aperture in member 94 and operatively secures arm 97 to member 94 so that the two move in unison with the bearing for journal 95 defining a pivot.

With arm 97 mounted in a position shown in FIGS. 7 and 8 cam follower roller 98 is gravity biased into engagement with cam 104 keyed to shaft 44a which drives front barrier rollers 44. Thus, it is seen that as shaft 44a rotates lifting means rollers 92 are oscillated from their low positions, just below the feed path defined by belt 25 to a position slightly thereabove (indicated by reference numeral 92a in FIG. 7), to engage the bottom of the stack and assist box blanks therein upward along incline 43 of front barrier means 15.

Lifting means 90 is oscillated when very long boxes are being stacked. Preferably the speed of shaft 44a causes lifting means 90 to oscillate through more than one cycle for each blank received. However, the assistance of lifting means 90 is not required during the stacking operation when shorter boxes are being stacked since at this time lift screws 12,13 apply sufficient support in the region of front barrier means 15. Under the latter circumstances arm 97 is rotated 180° so that it extends to the right with respect to FIG. 7 being repositioned in slot 96 and secured by thumb screw 103. Arms 91 are free to rotate counterclockwise by gravity and will assume a stable position with rollers 92 somewhat vertically below the pivot provided by journals 95.

Slapper bar 60, mounted for oscillatory motion parallel to the feed direction of blanks entering stack 14, is positioned at a level which corresponds to a point on barrier 15 which is the top of inclined front barrier section 43. Slapper bar 60 is provided with vertical surfaces 61,62 connected by inclined surface 64. Surfaces 61 and 62 are positioned generally opposite barrier surfaces 41 and 42 with surface 61 being offset in a forward direction with respect to surface 62. Further, transition surface 64 confronts the peripheral portion of rollers 44 connecting surface 41 and 42. As explained in certain of my aforesaid patents, oscillary motion of slapper bar 60 applies straightening forces to the front and rear edges of the folded tubular boxes as they rise in stack 14 to provide a straightening action for the box panels subsequent to formation of the glue or tape joint but prior to setting of the glue.

As the folded tubular boxes rise in stack 14 they rest against one another to prevent the glued or taped joints, as the case may be, from opening. During the delivery operation

downward pressure is maintained on the joints by slat 68 which extends forward from pivot 69 on transversely adjustable frame member 30 to a position over roller conveyor 18. Roller 70 is pivotally mounted at 71 to bracket 72 connected to slat 68 at a position forward of pivot 69 in the region of lift screws 12,13. At the time pushers 32 of delivery means 16 are about to engage the rear of pile 17 for removal thereof from stack 14, roller 70 rests against the top of pile 17 to apply a downward force thereto at the rear thereof which serves to counteract the tendency of the front to sag, this tendency being caused by the thickness of the screw thread which adds to the height of the stack at the rear thereof.

Holddown slat 75 rests against the top of stack 14 in the region of lift screws 12,13 to assist in maintaining the top of stack 14 substantially horizontal, especially at the time when pushers 32 initially move pile 17 in a forward direction past holdback spring fingers 74 and up inclined surface 76 of member 47.

Slat 75 is located below bar 68 so that while the latter remains in contact with pile 17 during the removal operation, slat 75 (as shown in FIG. 1) is free to rest against the remaining portion of stack 14 and exert downward pressure at the glue lap region.

As best seen in FIGS. 5 and 6 slat 75 is removably mounted to support 77 pivotally mounted at hinges 78,79 to the lower ends of parallel arms 80,81 respectively. The upper ends of arms 80,81 are pivotally connected at 82,83 respectively, to stationary frame member 30.

The removable connection between slat 75 and support 77 is provided by nut 84 mounted to screw 85 extending upwardly from slat 75 at the rear thereof with nut 84 being spaced from the upper surface of slat 75 by a distance slightly greater than the thickness of member 77. This space is fixed by conelike slat protrusion 86 through which screw 85 extends. Protrusion 86 extends into elongated slot 88 of member 77 having slanted sidewalls corresponding to the slanting surface of protrusion 86. Compression spring 89 extending outwardly through the right open end of housing 190 is secured to member 77 to the right or forward of arm 81 and engages block 191 on the upper surface of slat 75 located at a position sufficiently spaced from screw 85 to provide locking action with support 77, as will be described. Block 191 is held in position by screws 192,192 which extend into upper conical protrusions 193,193 of slat 75 which space block 191 from the upper surface of slat 75 by a distance equal to slightly greater than the thickness of member 77. Protrusions 193 are disposed in elongated slot 194 extending rearward from the forward edge of member 77. In order to dismount slat 75 from member 77, slat 75 is moved rearward to compress spring 89. When nut 84 moves to the rear of member 77, the rear of slat 78 is free to move downward to a position where screw 85 is below slat 75. Thereafter, salt 75 is movable forward until block 191 is forward of member 77.

Slat 75 is removably mounted to member 77 so that the former may be replaced by another slat of suitable length for use with boxes of a particular length. Pivoted parallel arms 80,81 provide a linkage which maintains slat 75 in a generally horizontal position. It is noted that stop 82a prevents gravity from pivoting arms 80,81 counterclockwise to a position as far as the vertical. Thus, when a new run is stared, rising stack 14 will always cause arms 80,81 to pivot counterclockwise with respect to their pivots 82,83.

The provision of inclined surface 43 at the lower end of barrier means 50 facilitates entry of blanks to the bottom of stack 14. That is, the front end of each blank delivered by conveyors 11 and 25 strike inclined surface 43 and naturally tend to move upward as a result of the incline. At the same time, the rear end of the blank is positively lifted by screws 12,13. Thus, the next blank is not required to wedge its way against the resistance offered by the full weight of stack 14 between stack 14 and the upper flight of conveyor belt 25 in order to reach front barrier 18.

Thus, it is seen that the instant invention provides an improved underfeeding stacking, straightening and delivery device by utilizing an inclined surface portion at the bottom of the front barrier means which arrests forward movement of blanks as they enter the stack. Belt friction is reduced and belt life is extended by utilizing a movable roller attached to the front barrier means for support of the stacker conveyor belt at the region where the belt intersects the front barrier means. Additionally, the belt may be supported by other rollers that are mounted to pivoted arms so that this last group of rollers may be selectively operated between active and inactive positions. Additionally, on longer boxes, the leading edges of the boxes are urged upward by the action of vertically oscillating rollers which alternately engage and release the bottom of the stack. Improved holddown means are provided in the form of a slat mounted to a parallel arm linkage and an elongated bar carrying a roller. The slat, roller, and bar all act to exert downward forces on the stack with the force locations being effective to maintain the glue joints closed and to prevent the front end of the stack from tipping downward and thereby impeding the takeoff operation.

Although there has been described a preferred embodiment of this novel invention, many variations and modification will now be apparent to those skilled in the art. Therefore, this invention is to be limited, not by the specific disclosure herein, but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. In combination, a machine for operating on box blanks and delivery apparatus adapted for use with said machine; said apparatus comprising a stacking means and a conveyor means for moving blanks issuing from said machine forward along a generally horizontal feed path to said stacking means; said stacking means constructed to form an underfed stack of those blanks issuing from said machine and including a first means providing a barrier means positioned forward of an entrance to said stacking means; said barrier means extending generally vertically above said feed path and positioned to engage leading edges of blanks moving along said feed path to thereby arrest forward movement of these blanks; means mounting said barrier means for adjustment by forward and rearward movement relative to said feed path, said conveyor means including continuous belt means extending forward of said barrier means; roller means; arm means; said roller means mounted on a rotational axis at one end of said arm means; said arm means being pivotally mounted at the other end thereof to pivot means extending parallel to the rotational axis of said roller means; said arm means being movable about said pivot means for selective operation of said roller means between discrete operative and inoperative positions with said inoperative position being below said operative position; said roller means when in said operative position being positioned between said entrance and said barrier means, and supporting an upper flight portion of said belt means from below; said roller means when in said inoperative position being ineffective to support said belt means.

2. A combination as set forth in claim 1 also including other roller means positioned forward of said roller means; other arm means; said other roller means mounted on a rotational axis at one end of said arm means; said other arm means being pivotally mounted at the other end thereof to other pivot means extending parallel to both of said rotational axes; said other arm means being movable about said other pivot means for selective operation of said other roller means between discrete operative and inoperative positions with the inoperative position for said other roller means being below the operative position therefor; said other roller means when in its said operative position being positioned between said barrier means and said entrance, and supporting another upper flight portion of said belt means from below; said other roller means when in its said inoperative position being ineffective to support said belt means; said arm means and said other arm means being movable independently of each other.

3. In combination, a machine for operating on box blanks and delivery apparatus adapted for use wit said machine; said apparatus comprising a stacking means and a conveyor means for moving blanks issuing from said machine forward along a generally horizontal feed path to said stacking means; said stacking means constructed to form an underfed stack of those blanks issuing from said machine and including a first means providing a barrier means positioned forward of an entrance to said stacking means; said barrier means extending generally vertically above said feed path and positioned to engage leading edges of blanks moving along said feed path to thereby arrest forward movement of these blanks; means mounting said barrier means for adjustment by forward and rearward movement relative to said feed path, said conveyor means including continuous belt means extending forward of said barrier means; roller means; means mounting said roller means for selective operation between an inoperative position below an operative position wherein said roller means supports an upper flight portion of said belt means from below; a roller device in the region of said barrier means and connected thereto for forward and rearward movement therewith; said roller device supporting an upper flight portion of said belt means from below.

4. A combination as set forth in claim 3 in which said roller device is positioned so that upon rearward movement of said barrier means said roller device may engage said roller means and operate the latter to said inoperative position.

5. In combination, a machine for operating on box blanks and delivery apparatus adapted for use with said machine; said apparatus comprising a stacking means and a conveyor means for moving blanks issuing from said machine forward along a generally horizontal feed path to said stacking means; said stacking means constructed to form an underfed stack of those blanks issuing from said machine and including a first means providing a barrier means extending generally vertically above said feed path and positioned to engage leading edges of blanks moving along feed path to thereby arrest forward movement of these blanks; means mounting said barrier means for adjustment by forward and rearward movement relative to said feed path; said conveyor means including continuous belt means extending forward of said barrier means; additional means connected to said barrier means for movement therewith and having a portion positioned rearward of said barrier means and forward of an entrance to said stacking means; means for oscillating said portion between a first position slightly above said feed path and a second position no higher than said feed path whereby said portion lifts blanks supported on said belt means.

6. A combination as set forth in claim 5 in which there is a means for manually operating said portion to a third position to raise blanks from said belt means to a position above said barrier means.

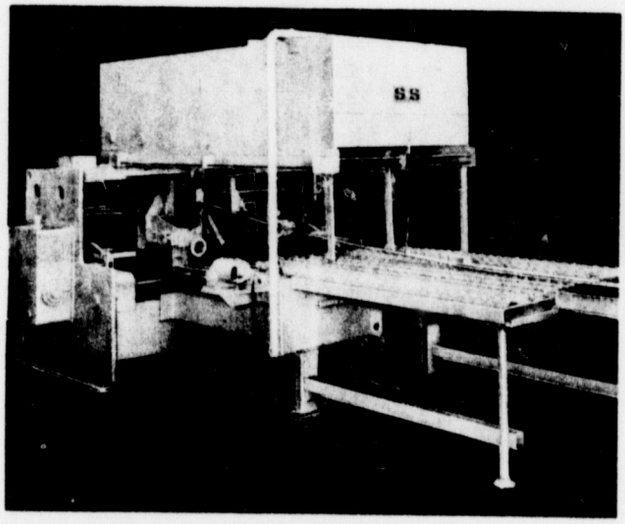
7. A combination as set forth in claim 5 in which said portion is oscillated through a plurality of cycles for each blank delivered to said stacking means.

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P 35

PLAINTIFFS' EXHIBIT 35 - FOURTH PAGE OF S&S BULLETIN

gauging rolls are positioned automatically during order changeovers. For making running gap adjustment, each set of gauging rolls is also individually adjustable by means of manually operated controls on both the operating and drive sides of the machine.

The spring-loaded forming rolls engage the top and bottom surfaces of the folded edge and smooth out ridges formed by improper board breakage about the creases. This is an important function where boxes are to be handled by automatic filling equipment.

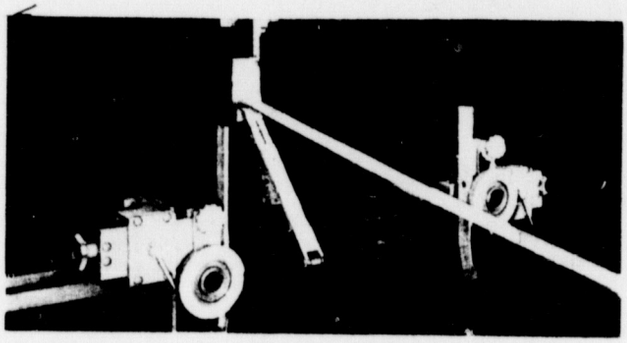


Delivery section

Squaring and Delivery Section

The delivery section of the machine performs the unique function of squaring, counting and ejecting uniform piles of boxes.

As each box leaves the folding section, it enters the delivery end receiving hopper. Spiral lift screws engage the side edges of the box and lift it clear of the leading edge of the subsequent box entering the hopper. The spiral lift screws support the boxes to keep them from buckling while being squared. Squaring action is applied by a reciprocating plate that strikes the trailing edge of the box eight to twelve times as it is carried up by the lift screws. The machine is provided with spiral lift screws, having different thread pitches to correspond with the board caliper variances that may be run. Special pitch screws for E-flute can be supplied. The screws can be changed in a matter of seconds without the use of special tools.



Spiral lift screws, safety cutoff switch, slapper bar, brake wheels, side guides and hold down assembly at delivery end

The leading edge of the receiving hopper frame is power adjusted to accomodate various box sizes. In addition, a manual fine adjustment is provided to obtain the proper squeeze between the slapper and front stop for squaring the boxes.

A mechanical counter is an integral part of the squaring and delivery section of the machine. Its operation is completely mechanical and easily set for piles of 15 to 40 boxes, in five-box increments, with the use of a gear shift.

As a pile of boxes builds in the delivery end receiving hopper, a cycling pusher mechanism with underhanging arms pushes the preselected quantity of boxes from the top of the hopper pile as the lower box of the pile leaves the last flight of the spiral lift screws.

No additional handling of boxes is required since counting, squaring and pile delivery is accomplished in one operation within the machine. The box count is not affected by machine speed, size or proportion of the box, or any variable conditions existing in the plant. In addition, the unit accurately counts all boxes, regardless of thickness (A-, B-, C-flute or double wall). The unit also permits a continuous visual inspection of quality by mass comparison of the boxes throughout the entire operation.

The delivery end comes equipped with a telescoping delivery conveyor and ten-foot long roller conveyor. This arrangement allows a tying machine, or other equipment, to be installed in a fixed position, while the telescoping portion of the conveyor shifts back and forth with the adjustable receiving hopper frame. In addition, the ten-foot roller conveyor affords more storage time for complete adhesive setting prior to bundling.

*** a machine operator for about a year, then worked in various positions in the production manufacturing department. I became vice president of manufacturing and eventually president.

Q Will you give me some dates as to when these events occurred, approximately?

A I became vice president of manufacturing in approximately 1950 and became president in 1955.

Q And you have been president since 1955 to date?

A Yes.

Q Going back to 1940, then, Mr. Flaum, will you tell me what your educational background was?

A I have an engineering degree from Lafayette College.

Q Your duties up until the time that you became president, did they involve -- were they primarily engineering duties?

A No, they were manufacturing.

Q How do you distinguish manufacturing duties from engineering duties?

A I would consider engineering duties to be more involved with the design and creation of the equipment.

Q Yes?

A And manufacturing is the term that applies to producing.

Q Prior to being vice president of manufacturing

* * *

***

particular question is, have you ever sold a machine with that type of pusher plate?

A The pusher plate on the machine we sell today is not exactly like this.

Q It is substantially different, is it not?

A I don't like to get into these semantic arguments. There are many features --

Q Well, is it different?

A I said that.

Q Yes.

Mr. Flaum, during this -- during the time or -- or let's say during 1955 and 1956 was your position at that time vice president of manufacturing?

A At what time?

Q Approximately 1955, 1956, in that area.

A No, I became president --

Q In 1955?

A In July of 1955.

Q What about in 1954? You were vice president in charge of manufacturing?

A Yes.

Q If such a machine was being built at that time, you would have had knowledge of it, would you not?

A Yes.

* * *

Q Will you tell me an instance when they weren't for your machines?

MR. FABER: When you say your machine you mean the folder-gluer, don't you?

MR. WYATT: No, I mean any device manufactured by S & S.

A We have been asked many times to sell our unit for application on other machines.

Q Yes?

A As a general policy we have determined not to do it.

Q Fine.

A But we did it in at least one case that I can recall.

Q And what is that case?

A It was a company in Canada.

I believe the name -- I think it is Bathurst.

Q Bathurst?

A I think so.

Q What application did the blank stacking, straightening and delivery device have in the Bathurst case?

A They applied it to a competitive folder-gluer.

Q What was the name of the competitive folder-gluer?

A I don't recall.

Q Do you have any patent rights to the device

* * *

* * *

could incorporate this device, this feature, could be adapted to other machines with adaptive parts.

Q These adaptive parts, do they relate to the timing of the pusher plate?

A I really couldn't say what all would be involved.

Q As far as these policy matters that you mentioned before that -- they relate to the sale of the device shown in Plaintiffs' Exhibit 1?

MR. BERLINER: Which policy matters are you referring to?

MR. WYATT: The general policy matters that Mr. Flaum referred to.

A The device shown in Exhibit 1 is a detail of a complete unit.

Q Yes?

A The policy referred to earlier referred to the complete stacking unit.

Q I understand that, and do these complete stacking units have the device shown in Plaintiffs' Exhibit 1 incorporated therein?

A Yes.

Q Do you have any records then, at all, of these policy matters?

A I couldn't say.

* * *

DEFENDANT'S EXHIBIT P - PAGES 16 and 67 OF DEPOSITION OF THEODORE LEY

***
line which I have labeled K (making mark).

At the bottom of the line there seems to be a foot extending to the right.

A Yes.

Q Will you please explain what element K is?

A I believe that is a leaf spring.

Q And the formation at the bottom of element K, what is that?

A I guess that is a bend in the spring.

Q Do you know why the spring is at the bottom of pusher F?

A I am not sure now.

Q Do you know why the formation is present at the bottom of element K?

A I would imagine to prevent rubbing of element K on the box.

Q Does element K remain in contact with a box as pusher F moves from left to right?

A Yes.

Q Are folded boxes A fed into stack E while pusher F is moving from right to left?

A No.

Q What mechanism halts the feeding of folded boxes A in stack E? * * *

* * *

A I am a graduate mechanical engineer.

Q When did you graduate?

A 1936.

Q What school?

A Columbia.

Q Have you worked as an engineer?

A I think that all of my business activity has involved use of engineering knowledge.

Q Have your activities been primarily in sales?

A Yes.

Q Will you please tell us another location wherein machines such as the one in Defendant's Exhibit 9 for identification can be located, rather than at Hankins?

A (No response.)

MR. WYATT: Off the record.

(Discussion off the record.)

MR. BERLINER: Please note for the record that by the end of this week Mr. Wyatt will furnish Mr. Berliner with the locations of the first machine of the Exhibit 9 type, and the location of another machine of this type, besides the Hankins plant in Union, New Jersey. * * *

MR. WYATT: I agree to that stipulation, with the one condition that I will want an

DEFENDANT'S EXHIBIT Q - PAGES 3, 4, and 23 OF DEPOSITION OF JUAN LOPEZ

It is further stipulated that all objections except as to the form of the questions are reserved to the trial.

It is further stipulated that counsel for the defendant shall furnish to counsel for the plaintiffs a copy of the transcript of the within examination before trial without charge.

- - -

J O H N L O P E Z, called as a witness, having been first duly sworn by David M. Horn, a Notary Public of the State of New York, testified as follows:

DIRECT EXAMINATION

BY MR. BERLINER:

Q Will you please state your full name?

A John Lopez.

Q What is your residence address?

A 3 Karen Terrace, Westfield, New Jersey.

Q Mr. Lopez, will you please outline your educational background?

A I don't have a formal degree, but I have taken courses in engineering that I thought would be necessary to help me out on my job.

Q What is your job?

A I am Director of Engineering for Universal Corrugated Box Machinery.

Q Are you also an officer of the corporation?

A No, sir.

Q How long have you held the position of Director of Engineering?

A For about 25 years or so.

Q What positions did you hold prior to that time, and where did you work?

A I worked for National Biscuit Company, Consolidated Film Industries and S & S Corrugated Paper Box Machinery Corporation.

Q How long did you work for S & S?

A For about ten or eleven years, I believe.

Q Was that immediately prior to your association with Universal?

A Yes.

Q What position did you hold at S & S?

A I started out as a machine designer, and then I was put in charge of the Engineering Department.

Q Did you ever work with Albert F. Shields at S & S?

A Yes, I did.

Q What type of work did you do?

A Machinery for the corrugated paper box industry.

* * *

* * *

Q The vertical rollers, then, actually move the blanks from the top of the stack?

A Yes, they do.

Q Going on to another point, then, have you observed both of these machines in operation that are shown in Defendant's Exhibits 2 and 9 for identification?

A Yes, I have.

Q Have you ever observed a blank being fed under the stack at the time that the pusher plates, F and R, are pushing a stack, or in operation, and pushing a stack?

A No.

Q Are these machines designed so that the pusher plates, F and R, operate so that they push a stack off the top without blanks --

MR. WYATT: Strike that question.

Q Are the machines shown in Defendant's Exhibits 2 and 9 for identification designed so that they will push the blanks off the top of the stack at a sufficiently fast rate so that there is no feed of blanks underneath the stack?

A Yes, they are.

Q And a final point, Mr. Lopez:

May I ask you whether the plate R which is illustrated in Defendant's Exhibit 9 for identification

* * *

DEFENDANT'S EXHIBIT R - PAGES 3, 4, 5, 6, 10 & 13
DEPOSITION OF ALBERT F. SHIELDS

A L B E R T F. S H I E L D S, residing at 43 Exeter Street, Forest Hills, New York, having been first duly sworn by the Notary Public, was examined and testified as follows:

EXAMINATION BY MR. WYATT:

Q Will you please state your name for the record?

A Albert F. Shields.

Q Where do you live, Mr. Shields?

A 43 Exeter Street, Forest Hills,.

Q Will you tell me what your present relationship is to the defendant, S & S Corrugated?

A I am vice president in charge of engineering.

Q You are then an officer of the defendant, is that correct?

A Yes.

Q How long have you been an officer of the defendant company, Mr. Shields?

A I think it is since about 1957, but I am not certain.

Q Mr. Shields, I ask you to trace for me your history of employment with S & S Corrugated, going back to the time when you were first employed and if you could as best you can give me the approximate dates of your various jobs and positions that you have held.

A I started with S & S in 1936, and at that time I was doing special designing work for them and special projects, and I worked part time for the company.

In 1946 I became busier at S & S, and I took on full-time work with them, but it wasn't until somewhat later, and I am not certain just when, that I became chief engineer. I would say possibly in the early fifties.

Q May I stop you for a second, Mr. Shields?

A Yes.

Q From 1936 through the early fifties, then, when you became chief engineer, you were doing engineering work during this period of time?

A Yes.

Q And that also involved design type work?

A Yes.

Q Could you go on then, please?

A Yes.

Well, after becoming chief engineer I -- as I say, I became vice president around 1957 as closely as I can remember, and I maintained that office until the present.

Q Prior to your employment by the defendant in 1936 can you tell me what other employment you may have had, prior to that time?

A I didn't have employment prior to that time because

I was still being educated. It was only after 1936 that I took on employment.

Q Between 1936 and 1946, when you became a full-time employee of the defendant, by whom were you employed?

A I was doing designing work for several companies. One was Keuffel & Esser in Hoboken, New Jersey. Also by the Morey Machinery Company, in Astoria. Also for the Sierbath Gear Company, who are also in New Jersey, and for several other companies that I did lesser work for.

Q Of these companies that you have named, Mr. Shields, were any of these people involved in the type of business that S & S is in?

A No.

Q What business is the S & S Corrugated Manufacturing Company in?

A Manufacture of corrugated paper machinery.

Q Would you tell me what your educational background is?

A I have an M.E. from Stevens Institute in 1931 and M.S. from Stevens in 1933, and a Doctor of Engineering from what is now called the Technical University of West Berlin.

Q What was the date of that?

A 1936.

Q What were your duties, Mr. Shields, more

specifically between the period of the early fifties when you became chief engineer up until 1957, when you became vice president?

A Well, they were to take charge of the engineering department and to carry on the design and development programs of the company.

Q Can you give me a little more explanation as to what you mean by take care of the engineering department; what responsibilities did that involve?

A Well, we had an engineering department that of course was growing in size. It was different sizes during different periods, but there were at that time maybe 30 or 40 people, and they had to be assigned design tasks and they had -- we had engineers as well as all the way down, designers, detailers, checkers, and we had an issuing group, a blueprint group. This is all the engineering department.

Q Did this involve manufacturing as well as new design?

A Well, we manufactured the designs usually right in our own plant.

Q Well, your duties involved, didn't they, manufacturing responsibilities?

A To a certain extent. * * *

* * *

BY MR. WYATT:

Q Here it is, I have it. I hand it to you, Mr. Shields.

A Yes.

Q Mr. Shields, can you tell me whether or not S & S has ever sold a device of the type illustrated in Fugures 1 and 2 of the Plaintiff's Exhibit 1, the Shields patent?

A Yes.

Q Can you tell, is S & S presently selling a device of the type shown in Figures 1 and 2?

A Yes, we are presently selling a device with this basic function.

Q This basic function?

A Yes.

Q But you aren't selling a device, for instance, with a pusher plate of the type shown on Figure 2, are you?

A It is a similar device. It is somewhat different to meet present-day requirements.

Q Have you ever sold a device of the type shown in Figure 2?

A Yes, we sold one.

Q Did you ever sell more than one?

A Not of this specific device.

* * *

*** present time.

Q And that is the machine that generally embodied the design shown in Figures 1 and 2 of Plaintiffs' Exhibit 1?

A Yes.

Q The Shields patent in suit?

A Yes.

Q Subsequent devices manufactured by S & S then were of a different construction and particularly a different construction of the pusher plate as shown in Figure 2, is that correct?

A No, not basically different. There were -- for instance, the pushers, if -- if I can divert for a minute, on the present machine, are like this pusher we see in Figure 2 except they have the ability to be set wider apart so as not to cock a box that is wider in order to push it off.

In order to meet conditions as they arose for larger boxes, et cetera, we had to expand this device.

Q Mr. Shields, I show you a document which we willl mark as Plaintiffs' Exhibit 4 for identification.

A Yes.

Q And that is a copy of Patent No. 3,409,148.

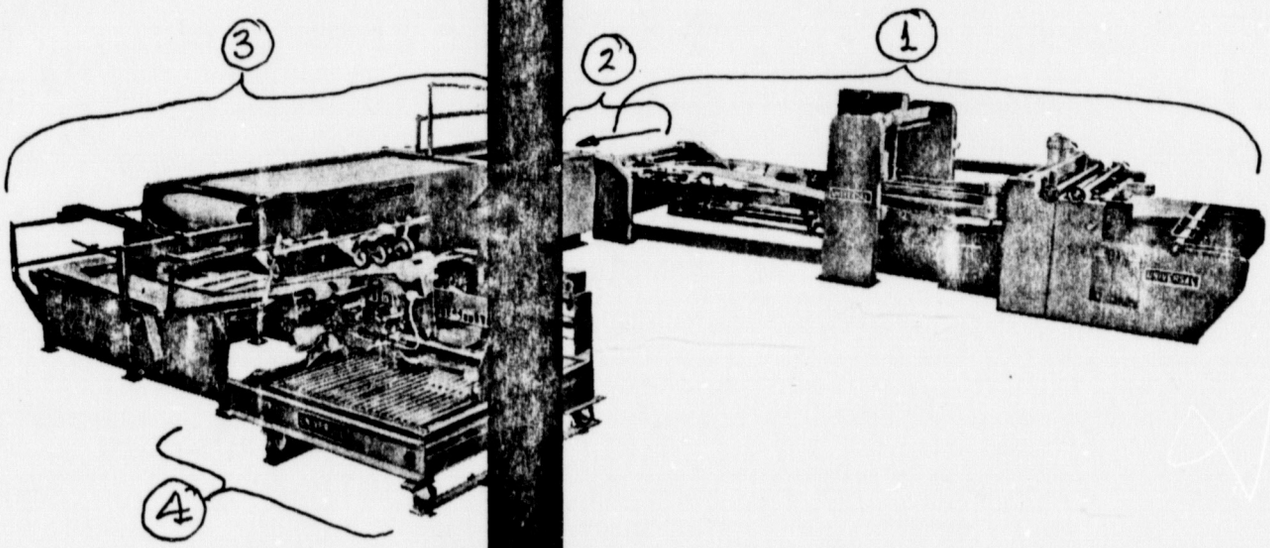
A Yes. * * *

PLTF 22
DEFT EXBT
NOV
DEFENDANT'S EXHIBIT 108 EU

THE ECONOMICS OF [illegible]E

UNIVER[illegible]AL COMET

MAKE GOOD SENSE [illegible]D GOOD PROFITS, TOO!



Do you know what the [illegible]et Suction Feed Folder Gluer can do for you? This versatile [illegible]ck-set machine handles the output of at least two printer slot[illegible]r die cutters, producing a wide variety of boxes on small or la[illegible]rders.

Available either in the [illegible] angle model for maximum versatility, or the straight line for [illegible]mum space saving.

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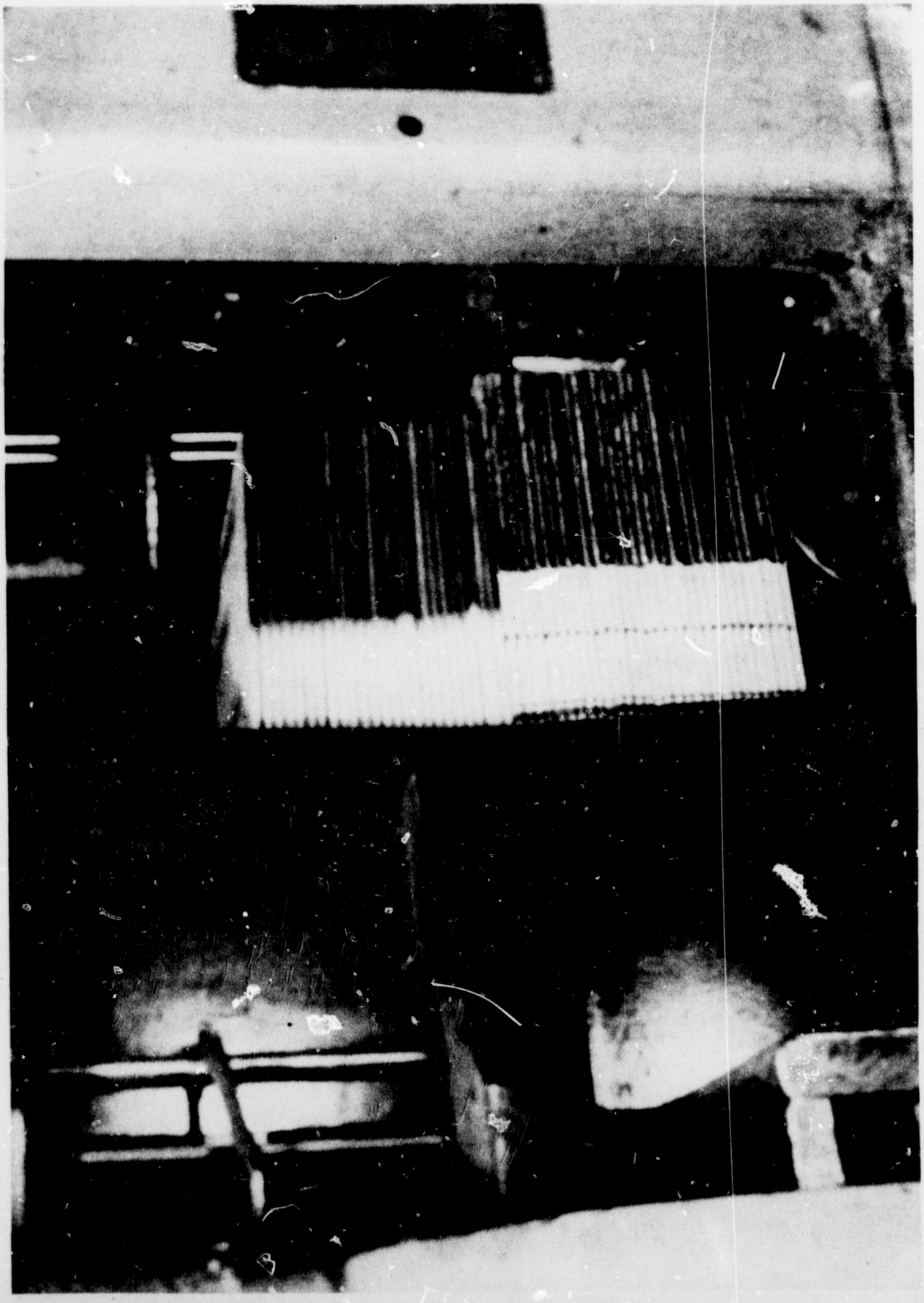
universal

corrugated box machinery operation, cranford, new jersey 07016

Circle no. 248 on Reader Service Card

DEFENDANT'S EXHIBIT E1 - PHOTOGRAPH

E128

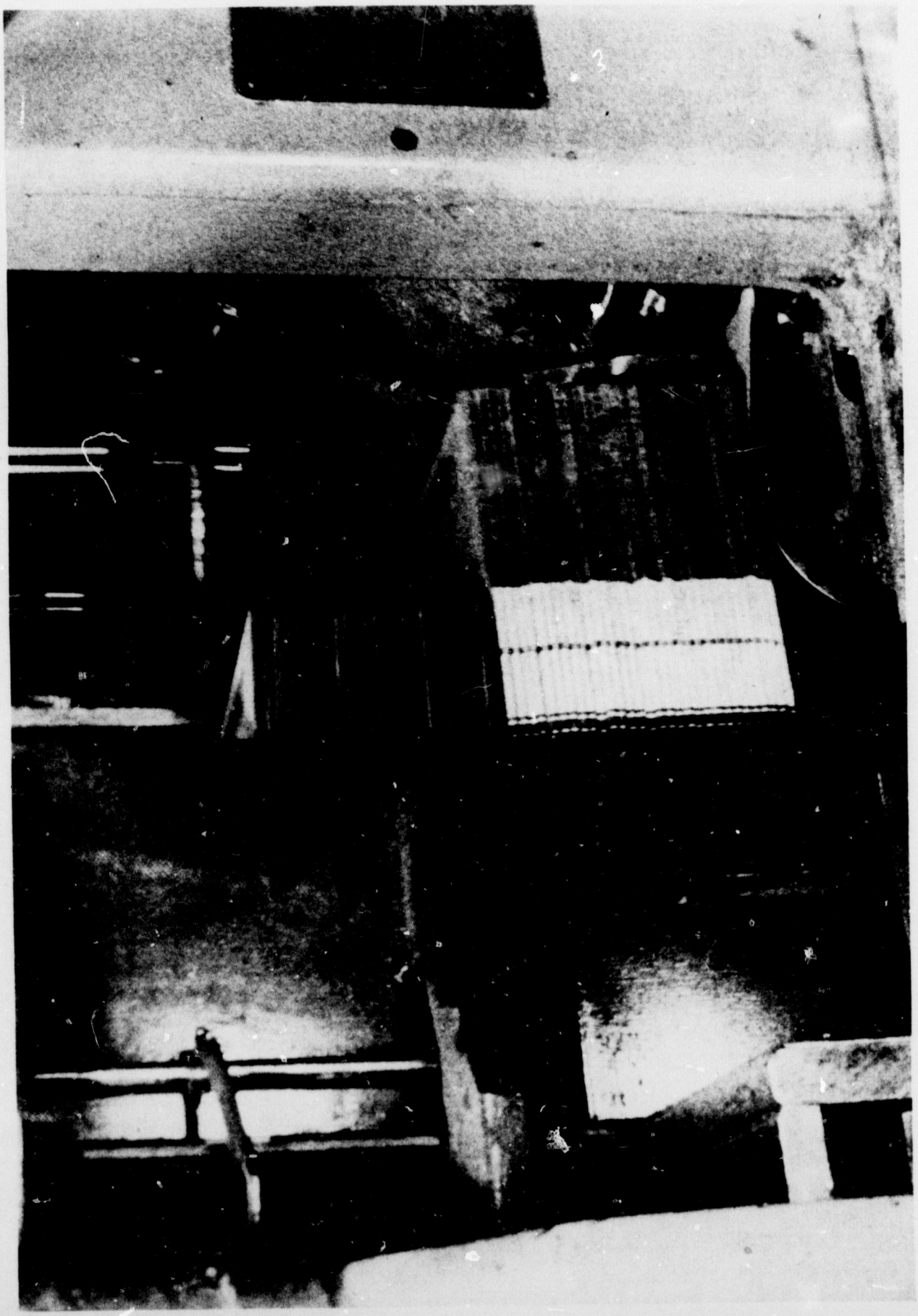


DEFENDANT'S EXHIBIT £2 - PHOTOGRAPH E12)



DEFENDANT'S EXHIBIT E3 - PHOTOGRAPH

E130

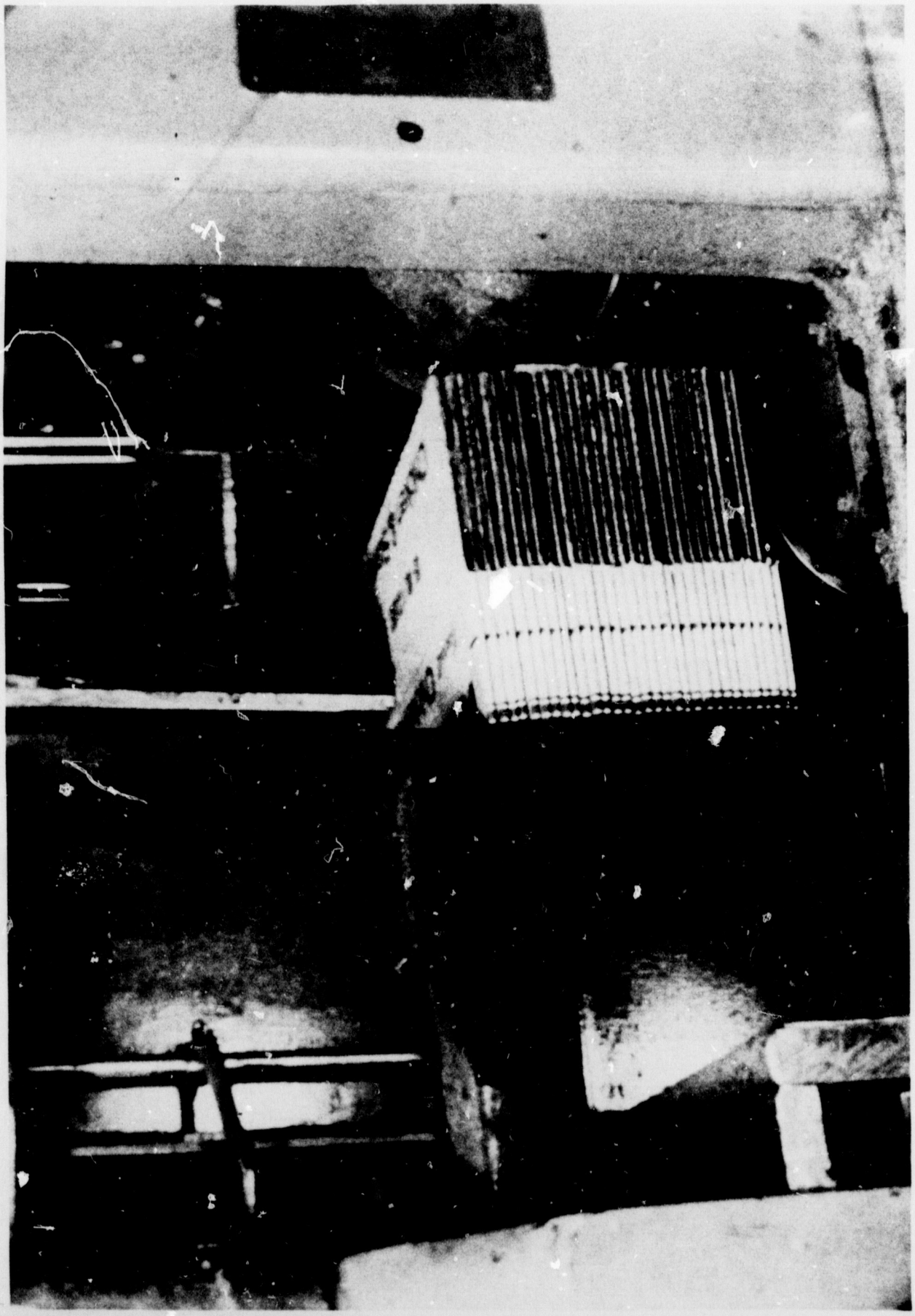


DEFENDANT's EXHIBIT E4 - PHOTOGRAPH

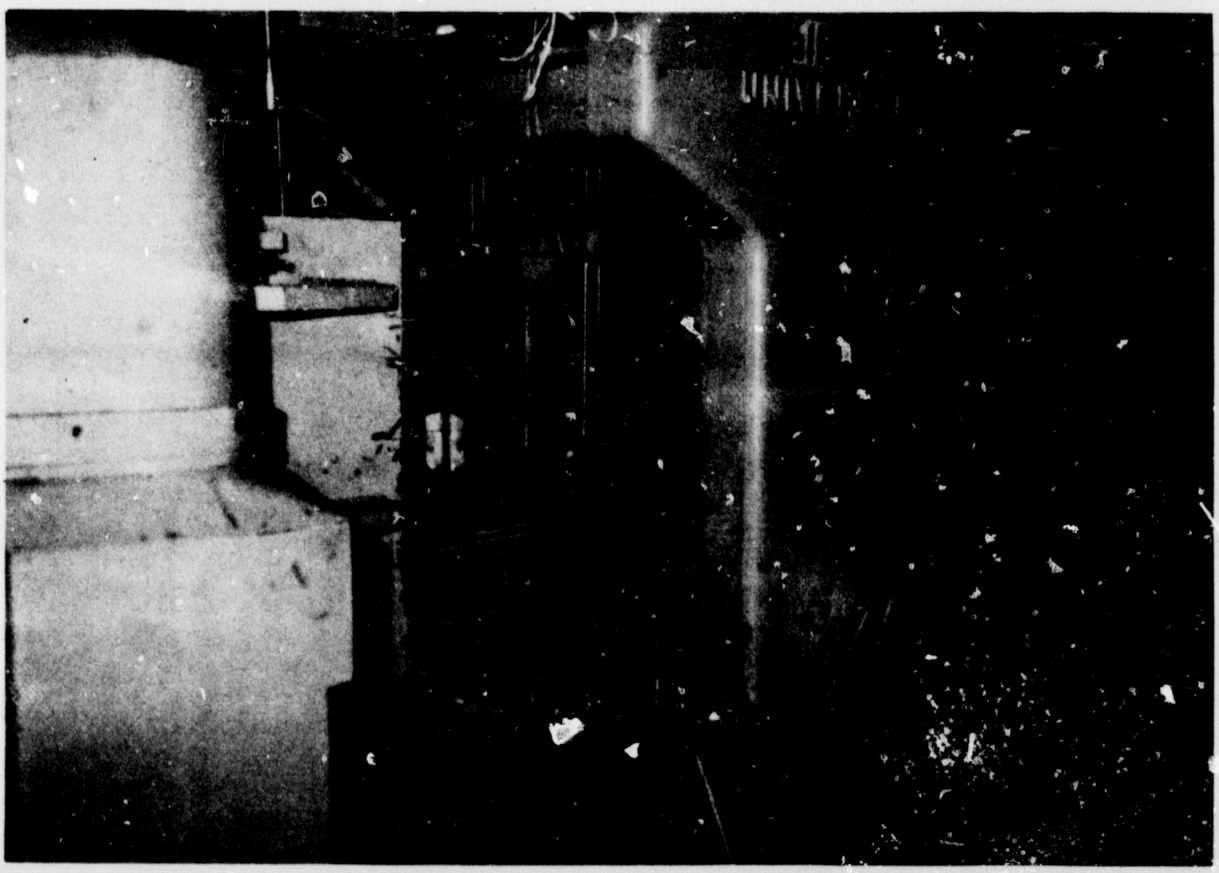
E131



DEFENDANT'S EXHIBIT E5 - PHOTOGRAPH







U.S. COURT OF APPEALS:SECOND CIRCUIT

KR KOPPERS CO., et al,
Plaintiffs-Appellees,

against

S&S CORRUGATED PAPER MACHINERY CO.,
Defendant-Appellant.

Index No.

Affidavit of Personal Service

STATE OF NEW YORK, COUNTY OF NEW YORK ss.:

I, Victor Ortega, being duly sworn,

deposes and says that deponent is not a party to the action, is over 18 years of age and resides at

1027 Avenue St. John, Bronx, New York

That on the 25th day of June 1974 at 280 Park Avenue, New York

deponent served the annexed Exhibit Volume upon

Wyatt, Gerber & Shoup-Attorneys for Appellees

the in this action by delivering a true copy thereof to said individual personally. Deponent knew the person so served to be the person mentioned and described in said papers as the Attorney(s) herein,

Victor Ortega

Print name beneath signature

VICTOR ORTEGA

Sworn to before me, this 25th day of June 19 74

Robert T. Brin

ROBERT T. BRIN
NOTARY PUBLIC, STATE OF NEW YORK
NO. 31 - 0418950
QUALIFIED IN NEW YORK COUNTY
COMMISSION EXPIRES MARCH 30, 1975